Mental Therapeutics

by

NORMAN BRIDGE, M.D., A.M., LL.D.

County of Los Angeles
Public Library

THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA
LOS ANGELES

LOS ANGELES COUNTY

FREE LIBRARY

610.4 Bridge
Mental therapeutics,
and other papers. 1

REFERENCE

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/mentaltherapeuti00bridiala

Mental Therapeutics

BOOKS BY THE AUTHOR

1—The Penalties of Taste
Duffield

2—The Rewards of Taste
Duffield

3—House-Health
Duffield

4—Fragments and Addresses
Bireley & Elson
Los Angeles

5—Tuberculosis—Lectures
Saunders

6—The Marching Years
Duffield

7—Mental Therapeutics and Other Papers
Duffield

Mental Therapeutics

AND OTHER PAPERS

BY

NORMAN BRIDGE

M.D., A.M., LL.D.

DUFFIELD & COMPANY
NEW YORK
MCMXXII

Los Angeles
DISCARDED
Los Angeles

COPYRIGHT, 1922, BY
NORMAN BRIDGE

Published April, 1922

PRESS OF
BIRELEY & ELSON PRINTING CO
LOS ANGELES

RT7
B76m

CONTENTS

MENTAL THERAPEUTICS 1

THE ECONOMIC WASTE OF SICKNESS AND PREMATURE DEATH 33

A DEFRAUDATION OF YOUTH 63

A PRESENTATION ADDRESS 85

EPHRAIM FLETCHER INGALS—THE MAN . . . 97

HENRY BACHMAN STEHMAN 111

ON THE HISTORY OF OIL 117

LOOKING AHEAD 137

HOSPITALS AND NURSES 161

CADET NURSES AND HOME NURSING 171

TO E. P. R. ON ATTAINING HIS SEVENTIETH YEAR 179

Los Angeles County Medical Library
Officially DISCARDED
Los Angeles, Cal.

206662

Mental Therapeutics

Mental Therapeutics*

Man's mental state is responsible for many of his sensations. An emotion can make him happy or unhappy; it may cause him to blush or blanch, to perspire freely and to shake with fear; it may fill his mouth with saliva or dry it in an instant; and it may suddenly stop his digestion. It is claimed that intense emotion can turn the hair gray in a few hours. It may cause a sudden intense pain in the head or elsewhere; may make the pulse irregular, and the heart to beat with such violence as to rupture a cerebral vessel; and it may cause death by the sudden giving out of the few remaining muscular fibres of a degenerate heart.

On the other hand, an emotion may drive away pain and discomfort, indigestion and sleeplessness, and turn grief into joy, and make a change in the governing impulse to action that may continue through life.

Irritability may cause one to be annoyed by trifles, and life to be made a continuous torture.

*Being a revision of "The Mind for a Remedy" in the author's book "The Rewards of Taste"—1902.

A contrary emotion may beget good temper in the midst of all the cumulative annoyances of life. Emotion with an idiosyncrasy or a weakness makes many of the forms of hysteria, as cultivation of the right emotions may prevent these symptoms.

Right emotions are sought always, and probably by everybody. Everybody would be happy if he could. If an emotion can drive away pain and increase tranquillity, every one who knows about it would naturally cultivate it. Nobody would willingly seek mental states that give him pain and indigestion, unhappiness and insomnia.

A thousand guide posts have directed men to the emotions that promise peace and freedom from suffering and discontent. Many of these are religious; hundreds of different shades of faith, and with all sorts of inspiration and philosophy. The range is wide, and all kinds of spirits and gods, and one God and Jesus Christ, are invoked in manifold variations; and people are told that by embracing this or that particular form they shall have some physical or spiritual advantage not given to the rest of mankind.

Some religions are urged upon unbelievers for the purpose of spiritual safety after death, with incidental advantages in this life; others, like one of the latest, are advocated because

they promise to rid the body of disease and bring happiness and harmony here—with certainty of happiness in the hereafter. One teaches that disease may be cured by prayer; another, that disease is an imaginary thing and that if you only understand it does not exist, it does not; still another, that the laying-on of hands or some weird gestures made over the patient will cure. One cult says that the human mind has a chemical quality and must learn to attract the desirable thoughts and emotions, and to repel those of an opposite sort, as chemical elements do. One writes of the majesty of calmness, another, of the wonders and the power of relaxing to give joy and strength; and another has convinced a considerable company that the great enemies of the race, and the potent makers of grief and sickness, are the emotions of anger and worry—two allied emotions, and doing a vast amount of mischief.

There can be no doubt of the value of these influences for relief to many people in various states of physical and mental trouble. They have by their own testimony received help and strength from them. There can be no doubt of this fact. If the help has come through the imagination, that is an explanation of the method and does not impeach the claim. So the treatment of the sick is not confined to medicines alone; other influences are quite as

valuable, even indispensable. People often do get well of painful disorders, if not dangerous ones, with the aid of helpful emotions.

Probably all of these influences have some power, and for different classes of people different values. Some of the measures are applicable to one person, some to another, depending on their respective idiosyncrasies. That the measures apply at all, and do good in some cases, is a lesson that scientific medicine ought not to lose. It must be confessed that in the main physicians have almost wholly failed to use for any good purpose these surprising influences.

The catalogue is a long one of the conditions of body and mind in which these influences work. It includes a large series of aches and pains, and of odd sensations like numbness and tingling, sometimes called paresthesia. It includes some faults of the functions of the body that are usually supposed to be wholly uninfluenced by mental states as, for example, many forms of bad digestion, and irregular action of stomach and intestines. It includes a wide range of mental perturbations, as insomnia, worry, anger, brain and nerve fatigue, hysteria in numerous forms, and all that combination of symptoms called neurasthenia. This word always means a worn-out or run-down condition of the mechanism of the brain that

is engaged in mental attention, in care-taking, and in liking or disliking people and things; and in the function of ideation—or plain thinking. Doubtless the brain and spinal cord are always involved together in these cases, but the brain most. The disorders are true psychoneuroses, a term that covers most forms of so-called hysteria and neurasthenia.

The influences named work for benefit in various ways; first by arousing expectation of relief; then by reducing such emotions as wear upon the nervous susceptibility, as worry, anger, suspiciousness, fear, jealousy, pride in danger, anxiety and sense of care and duty, and the emotional states of diffidence, mental tension —a nervous low flash point. These bad emotions are often overcome and displaced by new and better ones, such as hope, faith, love, aspiration, serenity, relaxation and imperturbability. These help one to endure without friction a flood of trouble and care that otherwise would be unbearable.

How these measures may be practically applied and the old emotions displaced by the new; and whether to any degree mystery or deception are justifiable in general, and to be fostered for either party (the one who needs the relief or the one who tries to give it) are serious questions that deserve the best study.

In some cases, and for some people it is not a question of the need of mystery to accomplish

the required purpose, for that is a certainty. Many people never can be appealed to on a wholly rational basis for any emotional effect; they cannot use their own unmysterious powers for their own relief. The only question is how far scientific caretakers of the sick, who themselves are not deluded or wool-blind, shall foster the idea of mystery and perhaps supernatural power in dealing with invalids, and just what their procedure and sequence of action ought to be.

Our ambition always must be for an unworn-out thinking machine that is not too emotional; this is the goal, and that gained, all else is easy. How to reach it is the problem. In all cases of so-called nervous prostration the chief desideratum must be (after or with restoration of bodily functions) to rest the brain machinery that is tired; i. e., change the trend of thought; give new scenes and occupations and stop the regular work. But this is not enough; we must change the current emotions and induce new thoughts not connected with the vocation or the things that have worried the victim and damaged the endurance. This last measure is the most potent of all influences, and is usually possible of realization. Hope and faith *can* take the place of despair and doubt, suspicion and melancholy. Tranquillity and relaxation *can* come instead of incessant tension, apprehension and exalted alertness. Imperturb-

ability *may* stand instead of fret, irritability, diffidence and fear; and benevolence and unselfishness instead of hate, envy and jealousy. The difficulty is to know how to bring these changes to people of all sorts of mental peculiarities and crotchets, as well as, perhaps, of moral perversity. When the transformation begins we discover a new being. A new birth in thought and freedom has occurred. The change manifestly cannot come to all people, only to most of them for whom the best efforts are made by themselves or others. There are at least three cardinal forces that start the process. They may be stated thus:

1. The power of the victim himself, as in the few instances where he knows his failings, and changes intelligently. He knows he has overworked and resolves to rest; he has fretted too much and has been governed by ignoble purposes, and resolves to change, and does it. Such people are the greatest and grandest in all the world.

2. The help of others who know better than the patient what his failings are and who point the way in a rational and kindly manner. These others are the friend, the doctor and the priest, who can persuade and convince without arousing that most formidable obstacle—the notion that unpleasant advice is unfriendly.

3. Some new influence brought into the mind that can change the bad emotional bent,

as some mystery or mysticism, some novelty or humbug, or a belief in the power of something beyond himself on which the patient leans or believes he leans.

These last—except when believers in a wholesome religion urge a reliance on divine power to help one to lift himself—are usually brought to the patient by the psychic, the quack, the believer in strange things, the mesmerizer, the intentional fakir, or the religious doctrinaire who is himself deluded. And the doctrines strike people in a thousand different ways, and find as many shades of criticism, doubt, credulity and blindness.

Probably the mystery cannot be dispensed with for all people at all times. Some must have it in one form or another, and it is not true that any of them wish to be humbugged; but they are susceptible to influences that come in the guise of mystery, and they cannot help it, nor learn to help it much. And the mystery is sure to come in one shape or another to susceptible natures, for all time. It has been so through the history of the race, and there is no ground to expect that it will change greatly. Wonderful effects from mysterious things, like secret nostrums and occult influences, will continue to be recorded hereafter as they have been heretofore.

The fact that the disorders and patients described have been the objects of charlatanry

so long, is no reason why we should not, in their behalf, resort to mental effects that are possible for good, and that are founded on the physiology of the brain and nervous system. Indeed, the scandals of the past are a sufficient reason, if there were no other, for considering this subject in a dispassionate and scientific manner. But the pathetic condition of a large class of nervous patients is another reason, and they deserve the best thought and talent of all experts in these very directions.

As to the situations and influences here referred to; and to all cases of sickness that are at all chronic, whatever may be their degree of severity or their peculiarity, it is clear that the doctor has certain very positive duties. As I conceive them, they are:

To see what brain and nerve powers and functions have gone wrong or are out of order, as shown by the mental and nervous symptoms, or otherwise.

To discover what functions of the body are wrong, that have been made so by mental influences, or that have caused the nervous disorder.

To study the personal qualities of individual patients and see how each can be affected in the best way by psychopathic as well as other influences, and to apply, with care and discretion, such measures as are found necessary for each case.

The first of these duties it would seem possible to do easily; yet it is not. Doctors are much more inclined to prescribe drugs or physical means for the supposed disease that they guess to be the cause of the symptoms, than to even seek for some causation in mental or emotional conditions. Indeed, as we study the sick, we too often forget all about the physiology of the nervous system, and especially the relation of the more voluntary to the more involuntary portions of it. If we would only try to know what powers and functions of the brain are going wrong, we could, I believe, often prevent insanity from occurring. And it is not difficult when we study a patient carefully, and have his confidence, to know whether his emotional and mental life are right or wrong, and if wrong what they need for correction. His insomnia is produced often by some annoying emotion; his loss of memory by introspection and worry, perhaps over imaginary bodily ills; his lightning nervous response by overwork and wrong emotional attitude toward his environment. So of many other mental and bodily symptoms. The fine art of the doctor is to gain the confidence of the patient so that he will reveal that part of his inner life which he usually hides completely.

As to the second duty, to see if physical functions are disturbed by mental forces, we almost never think of it. It does not occur

to us that a pain could be so produced, or indigestion or a coated tongue. And the suggestion that one could have a hemorrhage from the lungs or throat from the effect of emotion seems preposterous. Yet I have known beyond a peradventure such cases. Many cases of indigestion are made worse, if not produced, by eating hurriedly in a state of mental tension, or under depressing emotions of the class that are removable by other emotions invoked to displace them. Dyspeptics are accused of malingering because sometimes they can eat with impunity articles and quantities of food that usually cause them acute suffering. The fact is that with the right emotions digestion is better; with the usual ones it is worse. A dinner with friends and good feeling, and without cares or sense of haste, is a very different thing from bolting a little of even the best food under the pressure of worry from any cause.

That, with many persons, a moderate pain is made worse to their consciousness by their thinking and talking about it, and by their friends magnifying it, is as notorious as it is that the pain is often gone the moment they can ignore it. Yet we rarely make the smallest suggestion of mental influence in this class of cases. We seldom ask ourselves whether a pain is made worse by thinking on it, and if we do, and find such is the case, we are liable

to scold the patient or lose interest in him for this reason, when we ought to have the more interest, and might convince him of the mental element to his benefit. We could also enlist his friends to help him forget the pain, which is usually the reverse of what they do. Instead he usually gets a round of anodynes which are not completely effective, while he grows more and more alive to his sufferings, until his emotional condition becomes ripe for his being lulled into forgetfulness of the pain by any faith remedy or mental legerdemain that may be offered. The feeling of desperation has been reached where the victim will grasp at any straw of hope. A promise of positive relief is the greatest boon of all, and that is the pledge of the new remedy, whatever it is.

That the relief is complete in so many cases is proof that there are a great many imaginary and functional sufferers. It is proof also of what the doctor could do if he would try. Serious organic diseases do not get well by such influences, but they are a minority of all the cases of sickness. That as a rule there must be some lessening in the intellectual grasp of the normal relation of things, the usual sense of proportion, when a person can give himself over to such faith in mystery, does not help the matter nor excuse us. Moreover there are exceptions to this rule in the few

strong minds to whom some supposed novel phenomena seem inexplicable save on the theory of supernatural power; and they ignore their logic as a thing that has played them false. The claim made by some writers that these people are verging toward true insanity is not correct, but is, I presume, suggested by some of their own fixed theories about mental action. Fixed theories more than our logic are prone to play us false.

The third consideration is the most important of all for any practical application of psychopathic measures. People differ so widely that the same course cannot be pursued with all. It is true that most of the patients who come to us in need of these remedies ought to have to some extent the same, or nearly the same, management. They have nearly all had too many cares or concerns that have worried them in one way or another. These need to be cut down. They have exhausted the power of mental attention with likes and dislikes. Their irritability has become phenomenal, and their nervous equilibrium has reached the last limit of instability, and so the explosions of hysteria and neurasthenia come easily. This function of the brain requires rest and sleep to restore to their normal balance the brain cells. And the mischievous emotions need especially the antidote of wholesome indifference long

applied, and removed as far as possible from the causes that usually set them in motion. This means that neurasthenic men should get away from their business cares that nag, and that women should drop every social obligation and the demands of dress, and even the care of their homes and children for long periods, and get out to nature and a little way back toward barbarism.

Many of them have worn down their cerebral strength by anger and envy and jealousy, and need a new pasture of good fellowship and peace with the world. To this end their own families may need to be made over, or be born again; for they have often (of course unwittingly) helped to accentuate every fault and defect. Those that have suffered long have suffered more as the days have passed. Too much attention to the nerves that suffer has exalted their capacity to cry out. All such ought to be taken away from their sensations by some powerful influence that can completely engage the mind in hope and attention, and give them rest. Some of these people need to be removed for a time from the irritating presence of their own families—and change of place and scene helps most of them.

Some there are whose power of objective attention is always reduced save when in absolute health. When sick, even trivially, the subjective *me* is so exalted that they magnify their

symptoms incessantly, and fence themselves off as by a wall from the objective world. As long as they are a little sick nothing will help them but some power that can arouse their faith and interest to rise above their subjective trifles. They can never be depended on very far, even when well and able to forget their sensations and live an objective life of usefulness; for any trifling disorder, fatigue or accident unsettles them. They are unsafe to send on long campaigns; some trifling sensation will make them retreat in a hurry. They need to be dealt with carefully, for they are always lame on the slightest adverse occasion. And the word stoicism is not in their vocabulary.

Then, those with an abnormal tendency to psycho-neuroses (the hysterical constitution) are always troublesome, for their emotional natures are powder magazines ready to explode if they are merely jiggled. They need the same dose of rest from their usual emotions, and to have new and more wholesome ones introduced into their lives. They are constantly in the condition of a normal person who has been nervously overworked; their usual state is one of neurasthenia and they should be so managed, and large nervous tasks should never be expected of them.

They require more nerve rest, and more protection by good emotions from bad ones than their fellows, and they ought to be spared the

severer tests of common life. They need to travel in protected paths all their days. Moreover, many such need a service that is rarely done for them, namely, to be shown how they are constantly living with emotions that, being of the wholesome kind, are excessive in degree, or with those that are altogether wrong.

Standing in the way of this service is a peculiar secretiveness as to their emotional lives, which usually prevents their nearest friends from ever sounding their depths. They themselves, least of all, know and can study dispassionately their emotional lives, and their own families and fellows, instead of helping, usually aggravate their mental warping.

To apply the right remedy in each case successfully is impossible. The most we should expect is partial success, for the mental twists of the patients are so varied, as well as the degrees of tact we can use, that numerous misfits must occur. Moreover, it will be said that the prescriptions are impossible; that cares and worries cannot be laid aside; that one cannot forget his personal griefs and mortifications or change the emotional current of his life.

But there are thousands of people who have done this very thing when absorbed with some new thought or fad or faith; and some have been able to do it by the power of their own common sense applied to themselves. They do

not put aside their cares and griefs so much as they see the adjustment of them to the rest of the universe, and discover what an amount of needless worry is given to the things of a day, and see how their journeys are made easier by repressing certain emotions and encouraging others.

Lack of wisdom on the part of the doctor causes many failures. Tell a man that he imagines half his ills, and he may refuse to speak to you again. But tell him first that the mind of everyone affects the body always; then that he must be like other people; then ask him seriously to think if it is not possible for him to be dwelling too much on his ailment—and you have perhaps started him in the right direction willingly.

To a few it is safe to be blunt and severe, and to tell them of the mental element in their sickness, but it is rather a dangerous experiment, so fixed are sufferers in the reality of their woes. Any hint of auto-exaltation of woe or pain is generally taken as proof of unfriendliness and lack of sympathy. When such hints are taken agreeably the benefit is prompt.

Tell a man that his fret at being awake keeps him from sleeping, and you have hardly helped him at all. But show him how an honest desire to keep awake all night will put the mind into a mood of such tranquillity that the spirit of sleep will almost certainly come, and you

have removed his insomnia and transfigured his soul. Tell a woman not to fret at the ways and foolishness of others, and you are talking to the sea; but show her how these annoying ways are inevitably born to some people, and that they are ethnic curiosities to be amused at, and you have done her a service.

It is easy to deal with the patient who is so sensible that he can change his mental tendencies. You have only to show him that his emotional strain and his nervous agitation are too great, and he becomes tranquil and imperturbable. But such people are the rarest exceptions to the rule. More there are who are so constituted that they must have some mystery or quality of the unknowable to fix their faith on, in order to have any mental benefit. It is difficult to deal with these on the basis of perfect candor. To be frank and unmysterious is to fail to do them good. Your advice is too common and simple.

Is deception justifiable in such cases? The answer must be yes and no. The minds of the sick are many times distinctly abnormal, theoretically we cannot regard them as ever quite normal; and they are not capable of reasoning about their interests exactly like themselves in health. But many are at times more capable than the average of well people, and it is a great problem to deal with each of them. It is never right to be unfair to the best interests of the

sick. But it is not unfair to leave them in the dark as to the abstruse things of cerebral physiology that nobody understands completely. The plan of trying to explain everything to the patient has its drawbacks. It is never done anyway, for half the things the doctor tries to explain he only partly understands himself, and it is better for the patient's mind in most cases to be either dealt with dogmatically (usually involving a degree of laudable deception because the doctor pretends to know something he does not), or be left in some admitted doubt and uncertainty. This latter gives room for faith, which is wholesome.

Where the psychological element is strong we do wrong not to try to create faith and hope that may help. Whether this is done by the positiveness of the doctor or by something else matters little, as long as it is done. If religion can make one happy and hopeful, it is one of the natural rights of the sick man to have it; and if something that stands for it can in any way relieve cares and give rest of soul (which means emotional rest), it must not be withheld. No physician can justify his neglect of psychologic influences that give hope, on the ground of his efforts to be strictly scientific, when he considers his own shortcomings in every sort of knowledge.

A patient who has perhaps suffered long or who is impatient, asks for his doctor's views

about some one of the insubstantial cults, and the doctor is troubled to know what he shall reply that will comport with his duty to be helpful to the sick, and not strain his common sense or self-respect. His temptation is to say that it is all nonsense; that only weak-minded people take it up; that any good effects from it are imaginary; and that it tends toward mental unbalancing. Each of these declarations expresses a partial truth, yet they should not be said to the patient. To say them might constructively discredit a number of other religious beliefs, some of which the doctor himself may have great respect for. Besides, they do not express the exact truth.

The time comes in the mental experience of some people when they are tired of thinking (if they do think) and depending upon the science of things that is the common knowledge of the world. They seem to need something novel that does not require thinking, only believing. And sometimes the most unreasonable thing takes the best; the greater the jump from a basis of reason into chaos, the easier it is for some people to make it. Ought physicians wholly to discourage such things because the concepts believed are unscientific and absurd? This seems natural, but we must remember that the parts of all religions which people take on faith are inexplicable by any of our scientific formulas. Moreover nearly all

scientific men have had some religious beliefs no more justified on logical grounds than the non-existence of matter, or some of the equally absurd theories of our friends whose sanity we are tempted to impeach. And it is a psychologic fact that somehow such unreasoning faith helps to tranquillity of soul, and tends rather to good conduct among men, and this is one of the several compensations.

Why not be entirely truthful as well as candid with such inquiring people? We might then say this, and say it kindly: If you have reached a point where you must have something more than you now possess to pin your faith to, this new doctrine may serve. If you cannot make a haven of mental rest along the well-known laws of brain action but must have something occult or mysterious to lean upon, this new belief may help. If you are ready to deny the laws of nature as to your own body, while you rely on them in your business and money-making, this new thing is probably what you are looking for. If you can put aside your scruples about the common knowledge of all time, and cease to stickle for it, and give yourself unreasoningly to this new doctrine, it will probably give you mental comfort. Then the ridicule of the world of science that insists on the existence of matter, as well as that of the believers in the older religions will, by its very boon of martyrdom, make it

Los Angeles County Pub. Lib. Officially DISCARDED Los Angeles

206662

easier for you to believe and bear it all with sweet temper.

The cerebral wear and tear of our extreme civilization leads to many cases of neurasthenia and general uselessness, and to many sorts of hysteria and insanity. The medical profession and all thoughtful people alike ought to do something to lessen this for the hampered people who go about their business from day to day, and try to keep well, or pretend they are well. This service may, I believe, be done if we will study the subject with something of the enthusiasm with which we have pursued the microbes, and not ignore the influences that are wholly mental.

It is evident that the remedy lies either in the direction of lessening the load or increasing the cerebral capacity to bear it. There is small chance of increasing the power; a thousand years hence this may come to be done, perhaps by the process of development and the survival of the fittest through the centuries. At present the power of mental endurance, other things being equal, is substantially fixed for every person. It may be increased by various aids for brief periods only. As other things are usually unequal it can generally be more economically used than it is, and this, for the better business of life, is tantamount to increasing it somewhat. To lighten the load should be our aim, for the load is too heavy now, especially

in the refined and forceful society of America.

How to do this is the problem. It is easy to say we will begin by cultivating the better emotions and reducing the wearing ones, and by cutting down the needless burdens. But we have religions and ethics and philosophy, and through the centuries have been taught to keep the good emotions and discard the bad ones, and to put away foolishness. And, notwithstanding all our good precepts and some good examples, we have got into the bad ways of the present time. We must, evidently, be more specific as well as more radical in our measures. If any great good is done the remedies must be fundamental, and far-reaching in their effects; not a few must be influenced, but many, or no improvement will come to the community as a whole. But we ought to help the few, if we cannot reach the multitude.

A certain few cardinal things are apparently necessary to be done in the care and culture of the people, and they are mental and moral mostly.

1. We must lessen the emotional attentions to infants. These wear out the brain energy and produce erethism that may last through life. Almost any infant can, in three months, be developed into an autocrat, attempting to rule his world; and many of them have, before

the end of their first year, true neurasthenia resulting from these influences.

2. As far as possible we ought to let the children severely alone, and stop the common incessant effort to entertain them. This effort continues the harmful effect of too much emotional attention in infancy. Let them entertain themselves; this will develop their minds and rest their emotions. We ought to observe them, with their knowledge, and talk about them in their presence less. We do this now so much as to provoke a series of most vicious emotions that grow into bad life habits. Fairy tales and fairy talk are unwholesome to most of them. The average child already has too much imagination; it is a beautiful thing but it is not necessary to increase it.

Such rules for infants and children encounter many difficulties. Two motives actuate parents and children alike. The first is to see that the children are happy and pleased here and now. The reflex effect on their elders is pleasant; we like a happy child, and like to make a child happy. Thus we and the child conspire to the same end. The second motive is to make sure that, if possible, the career of the child shall be long and successful. Both emotions are for the good of the rising life as we understand it, the one for the now, and the other for the future. Is it any wonder that we should generally sacrifice the

future for the present? The child is incapable of foregoing a present pleasure for a future good, and the parents are too ready to agree not to count this day's indulgence, even when they know its ulterior effect is bad. A mother carries her baby in her arms a long time to get it to sleep because it likes to be carried and refuses to go to sleep in its bed. She says the child will not go to sleep otherwise, but if she reflects she knows this to be a tender-hearted fiction. Her fault is lack of courage to break the habit. As the child grows older and begins to acquire ways that she fears may make him inelegant or impolite she has no hesitation in working for his future, and she will drill him by the hour and worry by the day about his manners (that at fifteen he would spontaneously correct), and let him go on with nervous injuries that will last him through life. Parents are shocked if their boys smoke cigarettes, but they have allowed habits of the nervous system from babyhood up that are even worse for the future of a boy than smoking cigarettes in his teens. Parents who have perpetually entertained, coddled, and diverted their children, who have jumped to their call as to the command of a superior being, are logically estopped from objecting to cigarettes, coffee, wine or late hours, when the children pass into youth, and would still gratify their desires for all sorts of stimulating amusements. None of

these sins against nature is so great as those that have been earlier fostered and encouraged. Indeed, had the earlier ones never been committed, many of these later indulgences would not be sought. The exaltation of nerve centers, born of vicious excitement in childhood and continued in years of habits, cannot be ignored in later life.

Parents plead that their children ought to be obedient and self-denying as to indulgences that harm, because they, the parents, have been good to them in their infancy and childhood, have devised pleasures for them, and denied them little or nothing of joy. This is the very gist of the error. If the emotional propensities of the children had received as much tranquil rest as their muscles, their brains would have grown up with more normal demands and with better resisting power.

3. We ought to stop making young ladies and gentlemen out of children. To push them into responsible social life, as early as is the rule in the best social strata, is to develop emotions and cares, and subject them to tests and temptations that ought to be postponed for years. And the only justification we have for it is our and their unwholesome pleasure in it all, and their hoped-for escape from embarrassing diffidence later. The truth is that for many of them the diffidence is an advantage, and ought to be encouraged rather than otherwise.

4. We ought to decrease the emotional struggles at school as far as possible. The strife for supremacy, the fear of failure, the envy and jealousy of others, constitute one of the most wearing influences on the brains of the young.* Not all, by any means, but many of the school children suffer in this way. It is a duty to find out the ones being most harmed, and protect their nervous lives if possible.

5. An increase of the outdoor athletic life of the people as a whole would be one of the greatest gains of all. Indoor life keeps us below the par physiologic, and to raise the vigor of the system as a whole of course helps the brain.

6. To reduce and repress the unhappy emotions that are engendered by the struggle to shine in society and in business, is one of the most urgent needs, and hardest services to render. These emotions are envy, jealousy, fear of failure, and sense of danger to our pride, all of which are wearing and depressing. This is the school experience carried into adult life; and with all its ramifications it does incalculable harm to the cerebral resisting power. To reduce the struggle itself as well as its bad emotions is quite as important. This ardor to do the duties that society and business seem to impose on us (and beyond the getting of bread) is a large part of the cause of the

*The humiliation of failure in a school examination has driven many a fine boy to suicide.

nervous overwork among men and women. When a woman has neurasthenia from nervous overdoing, the chances are six in ten that the excess of work was done in response to a demand of some sort of social tyranny, and was thus by the highest ethics unnecessary. The same truth obtains with men only to a slightly lesser degree.

7. Less dress-parade in our lives is necessary. Reduce the everlasting dressing and parading of our persons, houses, tables and equipages! It all becomes a bug-bear to the tired-out brain, and it tires the brain. It is what makes women feel like going crazy when they think of packing their trunks for a trip to a fashionable resort, and it makes some of them really crazy. Such parade is a silly demand that our conceit and envy make upon us, to the worry of the tired brains, and with the paltriest return in life's recompenses.

8. It is merely a truism to say that people who are carrying mind and body loads that are too heavy should have them lightened. If the load is apparently necessary and free from the vice of bad emotions, the rest is as truly necessary. Rest and change are demanded. These influences shift the bearings; take off the pressure from parts and powers that are tired, and put into exercise faculties that have been dormant, so that the man as a whole is helped,

his brain and body are refreshed, and mental wreck is fought off.

The influences here condemned are what in large measure make the apparently inevitable revolutions of the wheel of American society. It is a spectacle that the old world has furnished, only in a different degree, again and again. Many eminent and resourceful families eventually fall behind in the greater world influences, while their places are taken by people who have come up from humbler beginnings. The rise to power of these is due to the fact that they have suffered less injury from the emotions that grind and wear out the nerve force. They have lived simpler lives nearer to nature, and have been moved by ambitions that are less carking and unwholesome.

This continual revolution of the wheel is self-acting and wholly conservative for mankind. The race and group fit to command, in the long run, usually come up to power. The lessening of grasp due to the dissipations incident to the use and abuse of power—the miscalled rewards of power—causes its victims to drop behind in the struggle and give place to those not handicapped by such influences. And the wheel promises to go on revolving as, and wherever, this debauchery of resources occurs, and nobody can deny that the struggle is fair, and the verdict world-wise.

The Economic Waste of Sickness and Premature Death

The Economic Waste of Sickness and Premature Death*

Throughout our years, from youth to age, we are individually prone to miscalculate the economies of our lives. We have aspirations and ambitions. We would get on in the world. We can earn so much. It will cost so much for food and shelter, for clothes and warmth, for schooling and for luxuries. We must have certain embellishments. A watch is an ornament and will usefully mark the time—it will cost one, or a hundred dollars. And we must have fine clothes and feathers and jewels, and amusements—we must play as well as work. Will our earnings compass all these?

Our calculations are based on the theory that these are all the elements, and that we shall continue to be here and able to work. We do not allow that perhaps we may fall sick, and find all our plans go wrong. So we provide no surplusage.

But we know that the pianist who loses a

*Delivered at the Central Presbyterian Church of Rochester, N. Y., on the occasion of the meeting of the American Public Health Association and the annual conference of the Sanitary Officers of the State of New York, September 8, 1915.

finger must change his occupation. We know that the chief oarsman who has the colic, or has eaten or drank too much, loses the race. To the engineman a spell of dizziness may cause a collision of trains; and the fame of a general, and the issue of a battle, may be lost by an attack of headache.

The problem is the same for every child. The career of your boy is at the mercy of your neighbor's boy who plays with him, and who has a throat diphtheria. Your boy is at the mercy of a slight blow on the back or the hip, which may disable him with joint tuberculosis, and make him a dependent for life instead of a power in the world. Or he may have an infected lung, or pleura, that knocks all your calculations awry; that transforms him from one who would lift to one who must lean all his life.

In planning our own and our children's lives we usually fail to make any calculation that health may break down, and that the individual may become a liability instead of an asset to his family and the community. If we could be compelled always to consider this vital interest, it would amount to the greatest single reform in society, for it would keep us and our children away from many of the pitfalls of physical calamity. The economics of health, sickness and premature death are at once the most

needed and most neglected subjects of our study.

We covet good health because it means longer life, which is the world's desire, and the first impulse of the normal human heart. Good health makes us forget the terrors of death. Pain and suffering, doubtless, are great discipline for us, but we always hate them and always must. Sickness handicaps us and blights our prospects and hopes for the joys we think we are entitled to. So in our quiet, sane moments we are ashamed of such of our foibles and our sins as bring on sickness; for this reason we try, some of the time, to lop off these and to keep well.

Less often do we consider the economic reasons for trying to keep well, yet they are among the most vital reasons of all. We not only neglect the calculation, we are often a little ashamed to broach the subject when it involves our friends and our families; it seems mercenary and ignoble. A man will warn his son to avoid carelessness and foolishness that might make him sick or handicap him for life; he will say, "If you get sick you'll have to go to bed, take disagreeable medicine, and be kept from pleasures—and you might die." He may warn the youth that if he gets sick his mother must nurse him, and that may make her sick, but not a word about the inability of the family to bear the expense of sickness. Yet

this may be the chief reason. Unable to afford a nurse, the mother nurses the family invalids and becomes one of them herself.

In an active practice of medicine of several decades, and having some familiarity with the life of many hundreds of families, I recall hardly an instance among lay people in which the caution for health's sake was frankly urged on economic grounds. And when it has been so urged it has usually been spoken of under the breath, as though it were a shame to put life and health on so sordid a basis.

But the economic basis is a most vital one, and money is our call on the world for the munitions that fight off sickness and death; for it is a fight, and a continuing one, till death takes us. Comfort, health, refuge from sickness and death, are often found by means of this potent thing called money.

Sickness and early death are the greatest drains on the resources of most of us—and more than any one influence handicap us, personally and in families, in our search for the things of life that are of paramount value. Sickness is our greatest pauperizer, as health is our greatest asset; and we usually ignore both of these truths.

The actuaries have made it easy for us to state, with some approach to accuracy, the money value of health, the loss to the community from sickness through loss of

earning time and from the expense that must be paid in cash. They have also shown us the vast public loss from child mortality. Not only is all sickness expensive, but epidemics have destroyed nations and peoples, have led to the defeat of armies, and have interrupted and postponed for centuries great public works that have been needed in the development of society and the safety of states. The Panama Canal is one of these.

There can be no doubt that the figures are fairly correct as to the ultimate cost and the loss to the individual and the public from these calamities, but the loss appears to be largely in the cutting off of possible future gains rather than from loss of so much cash out of pocket (except sickness expense); and so the public is slow to believe wholeheartedly in the figures.

The pecuniary worth, potential and prospective, of an individual at different ages is given by Fisher as follows:

At birth	$ 90
At 5 years	950
At 10 years	2,000
At 20 years	4,000
At 30 years	4,100
At 40 years	2,900
At 80 years minus	700

The value of life is figured on the possible earning power through the years that are promised for the individual, so the value of

the younger members is high; that of middle life is a diminishing amount; while the aged have less than nothing of value in this sort.

The annual cost of illness and death in the United States is conservatively placed at $460,000,000; let us add $500,000,000 for loss of earnings by the victims, and we have a total of $960,000,000.

According to the most thorough survey of Pittsburgh, covering the experience of typhoid fever for thirty-five years, Mr. F. E. Wing found that the cases lasted in disability an average of over thirty-four days, and that the cost to the community of each death was $6,000.[1] In four years the cost on this basis was $9,000,000. In October, 1907, before the filtration plant for the city water was finished, there were 593 cases. In October, 1908, after the plant was in use, there were ninety-six cases. Assuming that the 497 cases shown to be avoidable suffered a mortality of 10 per cent., which is a fair estimate, there were forty-nine deaths in one month, costing the community $294,000. At this rate the saving to the public would cover the cost of the filtration plant in nineteen months.

The loss by preventable or postponable deaths, the country over, is probably many

---

[1]Irving Fisher gave to the International Congress on Tuberculosis the actual cost of each death by tuberculosis as $8,000.

million dollars yearly. Fisher, some years ago, figured out the economic saving throughout the country, if needless sickness, deaths and fatigue could be prevented, as 1,500 millions of dollars annually. Nobody knows, or can know exactly, what proportion of deaths are preventable or postponable, but every student of the subject is sure that a very large proportion are preventable—or rather are capable of being postponed to a later time of life. Especially is this true of the deaths of infants and children. Much of the average increase of the span of life among enlightened peoples, from about 33 to 45 or more years, has unquestionably been due to the saving of child lives.

For a long time evidence has been accumulating that the average life is growing longer. Two hundred years ago the gain was 4 or 5 years in a century; one hundred years ago it was nearly 10 years per century; now it is at least 50 per cent. more than this, or in excess of 15 years per century, in this country.[1]

We may postulate, and we ought to assert, that the great purpose of public effort should be to make the world a better place to live in. That is a broad, simple, general proposition that is understandable. It is axiomatic.

What constitutes making the community a better place to live in? What must every

[1] The mortality in Chicago in 1921 was eleven (11) per 1,000 of the total population.

community do to this end? Many things may be necessary, and they will vary with local conditions, but they all tend and must tend in the final analysis to one aim, and that is the prolongation of the average human life. If human life is growing shorter, the world is a worse place; if growing longer, it is a better place.

The shortening of the average means more deaths in early years; lengthening it means fewer child deaths and more people reaching adult and advanced age; more people spared for the productive years of life. Longevity is fostered in all ages by good health and freedom from accidents and infections. These conditions connote longevity and the cutting out of the money losses of sickness, disablement, and death of prospective bread winners, otherwise the children.

With increase in average longevity the race is maintained numerically by a lower birth rate, and this invariably follows. A lower average birth rate means more vigorous mothers; fewer women destroyed in early life by excessive child bearing. Other things being equal, smaller families mean more vigorous children. High death rate among children means high birth rate. This usually means poverty, and may mean degradation. The child-bearing adults are sometimes so depressed in body and spirit by hard labor, by sickness and death about them, that all their higher

ambitions are destroyed; and this *is* degradation.

A late review[1] quotes some very meaningful statistics on this subject which, while possibly not entirely accurate for all of the countries considered, are doubtless comparatively correct. It says that of 21 countries, outside of America, 11 have an average longevity of over 50 years; the other 10 under 50 years. The 11 have an average birth rate of 24.9 annually per thousand people, and a death rate of 14.08. The 10 have analogous figures of 36.2 and 22.5. Russia has the highest birth and death rate—45 and 28.3 respectively, with a longevity of only 27.8 years, and an annual increase in population of 16.7 per cent. On the other hand, Australia has very low birth and death rates, and the highest longevity. The rates are birth 27.5, death 10.8, longevity 56, and natural increase 16.7—exactly the same as Russia. The writer compares Austria-Hungary with Great Britain. The former has a birth rate of 31.7, death rate 21.2, longevity 38.3 years, and annual increase of 10.5 per cent.; while the figures for Great Britain are birth 24.4, death 14.2, longevity 53.8, and annual increase 10.2 per cent. The increase being so similar in the countries compared with each other, he infers some natural law maintaining a fixed relation of births to the

[1] Editorial, North American Review, August, 1915.

deaths in a community. It is a logical conclusion, but the law is in part physiologic. It is not wholly some recondite "law" of unaided nature that lessens the births as the death rate falls. Other causes are a widespread reduction of marriages, especially of early ones, and a more or less extensive resort to methods of limiting the size of families. Under our laws it is a crime to teach such methods to others, but whether or not it is wicked, or how wicked soever it is, the practical fact is that some people discover methods and resort to them.

As people prosper, are more effective, live longer, become rich, educated and refined, the death rate decreases; so does the birth rate. Large families come to the few among this class who covet them, or believe on religious grounds that they ought to have them; but mainly they come to the poor, simple, uneducated, natural folk who love children and believe that God sends them, and these people are the stalwart ones who are forever rising in the scale of world values, and are becoming the controlling factors of society. This class itself degenerates later; and their descendants give place finally to like people as they were at the beginning, and so the wheel revolves.

With such percentages of annual increase in population as have been noted, the nations will some day reach the limit of convenient

existence. Famine, pestilence and war have, in the ages past, kept the race numerically within living bounds. With world fellowship and means of transportation increasing, and the increase of land production due to improved agriculture, famines will decrease; with pestilential epidemics coming steadily under more control with a promise of suppression of most of them, the sweeping mortality of plagues is becoming less common. When the combined food products of the earth are insufficient for the mouths that are to be fed, what will happen?

Speculation may be unprofitable, but it is a safe guess that the diminishing birth rate will, so far from destroying the race, actually save it in such circumstances. Nor will the progressive reduction of births endanger the existence of the race. With the refinements and luxury of the many who will live in that far-off time, there will always be more of the humble, simple, clean and physically strong people who will preserve the race from destruction, until the approach of the end of the habitable life of the earth. That will be millions of years in the future, and I believe that even then the human race will progressively adjust itself to the oncoming severe conditions, and live ages after we short-sighted people would naturally guess that the last man must die.

With increased longevity, life is easier, and easier because of it. Life for all the people can be easier only by reason of more substance, that is, less useless expense, less waste of energy. This means stable governments, stable and fixed conditions of living, continued through many generations; good public and personal hygiene long continued; constant watchfulness to guard against dangers of all sorts. It means in general, peace and plenty. Longevity is increased by conservation of the powers of the individual, and the lessening of forced hard work for long periods, especially by women and children. It is increased by regular, moderate work, and by wholesome attention, not with soul-breaking intensity, to all the serious problems of life. But too much luxury and idleness tend to rather early degeneration of the tissues of the body, and so a shortening of the average longevity.

Moral suasion will probably never produce the greatest progress for the betterment of mankind through improved health conditions. Nor will the good example of the small minority of excellent people who lead hygienic lives accomplish enough, although it will do much.

It is necessary, and will always be necessary, for an endless campaign of education among the people, most of whom are heedless and indifferent to the dangers of accidents and infections, and harm to others. Laws and

ordinances will be necessary, and their faithful execution more necessary. Political effort and agitation must be continued, so that a majority of the people will support all sane health measures. The force of law must be felt by the people of all classes, especially the careless and indifferent, to prevent them from making themselves sick, (to the public loss), and from endangering their neighbors. It is unsafe to live in a community where the moderate precautions of a sane public hygiene can be defied by any man or family with impunity.

In the last few decades one European state has signally illustrated this truth. During the last few years, the length of the average human life has been increasing in Europe as a whole at the rate of nearly seventeen years per century; in Prussia the gain has been at the rate of twenty-seven years. Why is this? It is certainly not accident or any one fortuitous circumstance that has done it. It is probably due to the frank obedience of the people to the health rules of a forceful government. The rules have been formulated by experts for the preservation of the health and the lives of the people; and all classes have obeyed with hardly a question. If there has been a question of the authority of the state in these matters, it has been hushed in a sentiment of loyalty to the Fatherland.

America is learning slowly that government is an instrument of force; it is learning a better respect for law, especially when the law is for the protection of all the people. We are outgrowing the old doctrine that every man has a right to do anything he likes, regardless of his neighbors, unless *he* can see that he is doing them some distinct harm. The bugbear of paternalism is also passing, and the mass of the people in the most progressive communities will not tolerate the logical results of the notion that there is no need of public hygiene.

It is only by a study of well-recorded facts bearing on the public health that we may surely know whether or not we are harming our neighbors. Prussia illustrates the effect of militarism, as applied to the preservation of health, and shows the value of *compelling* people to avoid infection, carelessness and excesses that tend to sickness and death.

Will better public health, gained by methods that may seem militaristic, develop in the people that sort of vigor and virility that will tend to a martial attitude toward other nations and threaten or produce war? Such a suspicion is groundless, even childish. Wars are brought about by human selfishness, jealousy, egoism, suspicion and hate between peoples and rulers of peoples. All methods for better health, whether forceful or otherwise, are for the benefit of the nation employing them,

and tend to peace—never toward war against another nation, unless that nation violates flagrantly the health interests of its neighbors.

We have, in this country, done a few things which show that we are becoming awake to the need of public and private hygiene. In some of our large cities we have, within a few years, lowered our annual death rate from twenty per thousand of population to fourteen or lower, largely as a result of the most constant watchfulness and insistence on health regulations. Here are a few of the measures that have brought down the death rate and raised the average age of the people:

1. By improvement in milk supply in cities and towns, the amount of bad milk sold has been reduced often to less than one tenth of the former figure. This gain has been made at the cost of stringent ordinances, constant watchfulness of the milk supply, daily laboratory examinations of the milk, frequent inspections of farms, herds and dairies, and frequent and merciless prosecutions. And the struggle goes on for still better hygienic and economic conditions of milk supply—and there is need enough for it. Rochester (N. Y.) is wasting a half million dollars annually in the way her milk is delivered to her people.

2. Diphtheria antitoxin, and the almost universal use of it in cases of this disease, has materially lowered the death rate. The cost

has been a campaign of education of the medical profession and public as to the life-saving value of the measure; the supply of the article free for the poor; the examination of throat specimens at public cost, and the insistence on scrupulosity in the manufacture of antitoxin.

3. Improvement in water supply for urban and rural populations, often at enormous expense to the public, has cost strenuous political, educational and social campaigns to induce the governments to vote the appropriations. For the effect of this measure on the death records we need only to look at the typhoid mortality of two cities, before and after. These are Chicago and Philadelphia; the drainage canal in the former, and the filter plant in the latter.

4. The destruction of mosquitoes in the prevention of malaria and yellow fever. These fevers have been among the most destructive and expensive in all history. It is impossible to compute the annual cost of them to the world before the mosquito discoveries, but it must have been scores of millions. The cost of mosquito destruction has been high; but it is a trifle compared with the cost of the diseases they produced. The control of plague and cholera constitutes a similar story. Like yellow fever, they often occur in epidemics. We know their microbic causes, and have learned

how to stamp out the epidemics, and, to a degree, how to prevent them. Dr. Blue, the head of our federal health service, has shown us how these ends are attained; and our Dr. Strong, the hero of Mukden, has, in that city with a terrific epidemic of pulmonary plague, accomplished one of the most brilliant feats of control in all history.

5. Tenement house inspection and the prevention of overcrowding is a good measure that has met with less popular opposition than many other reforms.

6. The regular inspection of schools by medically educated experts eliminates children capable of spreading infection, and helps toward the relief of those handicapped by disorders that are correctable. This measure is being adopted by most progressive cities, often in the face of strong and persistent opposition. It is subject to few drawbacks, and has been almost free from abuse. It is increasingly popular, and ought to be.

7. Scientific midwifery among the poor at the hands of selected dispensary physicians and visiting nurses, and instructions to poor and ignorant mothers in the care and feeding of their babies (with free milk, if necessary). By means of these and similar measures, New York City has, within a few years, reduced its death rate among children under one year of age by more than 30 per cent. This record

will be repeated by many other cities and by the more advanced country regions. But it will probably be a long day before we can match New Zealand, which has the lowest infant mortality in the world.

The poor people have, of course, accepted these benefits gladly, but the public has required vast argument before voting the needed money. With such a record before it, the public is guilty of a flagrant waste of its own substance and of constructive manslaughter, if it refuses to supply the funds.

8. Visiting nurses for the ordinary sickness, in cities, instructing and helping families that need it, prevent a lot of sickness, and they hasten recovery in many cases, and so cut down the cost of such calamities. The governing bodies of cities are usually slow to discover the value of this measure.

9. Vaccination against smallpox and typhoid fever. That against smallpox, notwithstanding bitter opposition, has for many years been so general that a considerable immunity among the people seems to have been established; and that against typhoid fever will before many years, if we can bring the facts to the knowledge of the people, become very common—with the result that typhoid will become a rare disease in the general community, as it is now in the armies of the enlightened world.

10. The pure food and drug laws now in force in this country have contributed to better health among the people, as they have repressed certain forms of unfair dealing and fraud among manufacturers and merchants. This reform was bitterly opposed in Congress and the legislatures for many years by certain powerful business interests.

11. The regulation and partial suppression of the use of alcohol has cut out a great amount of useless expense to the people, and it has reduced the amount of sickness. This is the verdict of the statisticians generally, notwithstanding the contention to the contrary by some good men. I believe that no woman has made such contention. We have undertaken, by federal law, to suppress the popular use of opium and cocain, except in cases of known and necessitous sickness. And public sentiment will not allow this law to be repealed. We have made no large attempts at reducing the use of tobacco, except for children. Tobacco has been shown to increase the death rate, and the habit is a money-eater. Besides being very costly, it is probably the most grotesquely curious habit of the human race; speaking generally, no one ever began the use of tobacco because he, by himself, at first desired it. Probably a thousand million dollars annually is spent because of the tobacco habit.

12. The fashion for fresh air, outdoor

sleeping, and athletics among students and the young generally is a powerful aid to hygiene, and has lessened the death rate. Let us pray that the fashion will not change. Draughts of fresh air do not cause colds; these are due to some derangement of the body health. And all the advantages of a flood of fresh air are gained by a moderate amount of it, if it is kept in motion; hence electric fans and a lesser coal bill are in order.

13. Taking some tuberculous patients off the street where they are careless with their sputum, and sending them to proper sanatoriums, not only help them, but protect the public. Thousands of such patients are now in such places, where under watchful care they harm nobody, and have some chance of recovery themselves. Hundreds of sanatoriums, state, municipal and private, have been built and are operated at great expense, but the saving of life has much more than covered the cost. The public education as to the dangers from careless spitting has returned more value to the public than the cost of all the sanatoriums. But this education is not more than a quarter accomplished. The propaganda must be kept up until all the people know and remember the facts.

14. The cure of hookworm disease is one of the greatest gains. We are amazed that a few cents' worth (less than one day's wage of a

laboring man) of a harmless medicine could cure so destructive and costly a disease. It is now within the possibilities to make uncinariasis a rare disease, and incapable of wearing out a single patient. In Porto Rico 89,000 people were cured at a cost of 54 cents each.

Other reforms must follow, and a great and united popular sentiment push forward all such as can minimize the sickness of mankind, so that there shall be a constantly increasing number of people who will escape death until overtaken by the unavoidable degeneration of tissue due to age. Even some of these degenerations will doubtless be found preventable or postponable to a later time in life than they usually now occur.

Here are a few of the things to hope for:

(a) More educated health officers, and more education for them in universities. They must be sane people, men and women—certainly women as well as men!—who know how to get along with other people; who can usually get the laws carried out with the least friction; and who respect the rights of the people while loyal to the law; who are jealous of the rights of the weak and helpless; and who do not have an excess of official dignity, with projecting elbows. Such are people capable of proposing new and better health regulations than we have; and they can convince the majority of their constituents of the necessity of progress, and

of the value of the reforms they propose. Many health officers, like other public servants, are autocratic, uncompromising and apparently anxious to show and use their authority. Neither the cause nor the public good needs such servants. People in authority, when obliged to use their power in ways likely to be displeasing to the people affected, should always regret, and act as though they regretted, to use their power with severity—and then use it politely if firmly, and only after persuasion. This is the hand within the velvet glove that usually accomplishes the difficult object with thanks rather than execration from the public.

(b) Improvement in the hygiene of rural life and rural schools. Both are disgracefully below the standard in cities. Country life ought to be the healthiest life of all; and country schools can, with only moderate industry, be made as wholesome as any school in the metropolis. The movement by two great organizations, the American Medical Association and the National Educational Association, to further this purpose ought to have our hearty encouragement. It is a profitable measure and means health and wealth for the whole country. It has not kept pace with the progress in the conveniences of country life, such as better roads, automobiles, telephones and free mail delivery. The country people are lamentably neglected in the matter of hospital care

and expert nursing. A few of our states have awakened to the necessity of enabling counties to provide proper hospitals and nurses for rural communities. This movement ought to be advanced by every means possible.

(c) We should teach early and late the value of keeping the physical body up to normal vigor all the time. It wards off sicknesses and helps us to weather them when they are unavoidable, and it often keeps us out of the expensive hands of doctors and nurses. Early diagnosis of apparently trifling ailments is important. Severe diseases are thereby often prevented. This is what the school inspection doctors do for the children. In sickness, procrastination is one of the most expensive and dangerous of our indulgences.

(d) We need to make a more vigorous campaign against flies, mosquitoes and vermin. Swatting the fly is good, but it is a makeshift. We must destroy the breeding places of flies and mosquitoes. We know the methods of doing this, and it is infinitely cheaper than our burden from the unlimited breeding of these pests. But one careless and indifferent family in a neighborhood can furnish breeding places for the flies and mosquitoes for the town, and nothing will do effectively but an ordinance requiring the health officer to declare all such places to be nuisances, and to compel their abatement. This, with public sentiment to sus-

tain the officer, would reduce these insects to a trifling inconvenience. And one popular and successful movement that could enact such an ordinance and cause its effective enforcement would mean a general interest in public health, insuring other reforms that would give the community a nation-wide, enviable reputation, and insure the lowest death rate.

The importance of body vermin in spreading infectious diseases has been emphasized by recent studies in typhus fever. Certain of the warring nations of Europe are profitably carrying out extensive measures for scrubbing the bodies of their soldiers, and disinfecting their clothing by heat.

We might profitably increase our facilities for free baths for the poor in cities. The bath house might have facilities for heating safely and quickly each bather's clothing while he is in the bath. The self-respecting bathers would probably resent the suggestion of vermin in their clothing, but they would not object to the disinfection if told that their clothes might contain tubercle or typhoid bacilli, and that the oven would not harm the garments.

(e) We ought to make a larger effort to lessen the spread and havoc of the venereal diseases. The economic loss to the nation from them is beyond computation. The results are great suffering, disabling complications that are sometimes mortal, blindness, insanity, bar-

renness, locomotor ataxia, aneurysms, loss of service and other multiplied calamities. The list is long and sickening. And the diseases are widespread, especially in cities. In New York in one year the number of cases was over 4 per cent. of the whole population.

We have done a few things to lessen them a little, mostly working around the edges of the problem, as it were, without attacking it in the direction of its greatest menace. We have to some degree banished the promiscuous drinking cup in public places, on railroad trains, and where numbers of people are employed. This helps a little, and is a good object lesson in hygiene.

We have advised against promiscuous lip kissing, with small result to change a fashion.

We have encouraged the use of domestic and toilet facilities that tend to lessen the spread of the diseases.

We are, with admirable unanimity, successfully fighting against segregation and official examination of prostitutes. This will remove somewhat the temptation to men and boys towards the dark ways—with a fatuous sense of safety that never exists.

We have reduced somewhat the use of alcoholics, for these have led countless thousands of men and boys to contract these diseases, who otherwise would have had enough caution, self-respect and resolution to avoid exposure to them.

We have begun to get over our cowardice and prudery, and to give a few boys and girls some slight knowledge of sex hygiene and how to avoid these infections.

We have, by an admirable addition to the principles of medical ethics, unlimbered the tongues and courage of physicians who can and will, better than formerly, protect women known to them to be in danger through expected marriage. The certificates of perfect health before marriage that a few clergymen are demanding will do a little good, but not much, because of accommodating physicians and careless examinations by those unskilled.

Surgeons, in treating these diseases, are more cautious than formerly to avoid infection, by the use of rubber gloves and other devices.

We have seen most of a certain class of doctors shamed against further spreading of that abominable physiologic heresy that the health of any man requires sexual indulgence. Their subsidence has undoubtedly lessened a little the spread of these diseases, as it has lessened the degradation of man.

We are more and more providing quick and efficient hospital and dispensary care for the poor who are overtaken by these infections, for this is humane, and is a protection to the community. Every such patient is a constant menace to the people about him.

Lastly, we are preaching the gospel of a

single standard of morality for men and women alike. This is right as well as righteous, and will do good as far as it goes; but with a present record of 60 per cent. of syphilitic women, having received the infection from their husbands, it is to be feared that it will not for many years greatly influence the spread of venereal diseases. Not 1 per cent. of syphilitic men receive the infection from their wives.

Probably the most effective means within our power to lessen greatly the spread of these diseases is the general education of the young of both sexes as to their nature, their baneful effects and the way to avoid them. But this measure, clearly the right of every boy and girl to have for their own protection, and much desired by them, is strongly opposed by many good people for reasons that seem to me utterly inadequate and even nonsensical. May the wisdom of these sensitive people, the love of their kind, their respect for essential purity and the rights of the young so increase that they may come to know that whatever knowledge is necessary in order to be healthy and avoid death is proper for young and old alike; and that not forever shall the best youths of our land be allowed by their ignorance to go blindly to their destruction.

(f) Finally, and never to be forgotten, the progress we have made in cutting down the

death rate has been due to the results of scientific research during the last few decades. But for this research we would still have a death rate in our cities of twenty to twenty-four per thousand annually instead of fourteen or less.[1] In this progressive work the pathologists of America have had a great part.

The wonderful results so far achieved are a promise of greater yet to come, and tuberculosis, cancer, diabetes, pneumonia and other destroyers of mankind will be conquered. The public health weather vane points to more endowment of research, and that is what we most need. The workers are ready, but the public says the endowments are expensive. That is true, but the beneficial results are one hundredfold greater than the cost.

The promise of further reduction in the death rate is in two factors only: the more efficient use of the knowledge which research has already given us, and of the new knowledge which further research is bound to produce. On this progress we pin our faith, in the calm certainty that it will not fail us.

[1] In 1921 the death rate of many cities in the United States was 11 per 1000 of population, or less.

A Defraudation of Youth

A Defraudation of Youth*

There is constantly being lost in this country a vast amount of the best potential promise of childhood and youth, by a neglect that cannot be defended on any ground whatever. Not only is power lost, but happiness as well; and nobody is benefited by the waste.

The punishment falls on a class of exceptional and usually bright children, who happen to be unfitted for the particular gait of the majority. The mischief mostly occurs during the school period of life, when the child is acquiring his mental working tools, and making preparation for what ought to be forty productive years.

This period of life is vital for the future, both for the child and the community, for our civilization depends on the continuous mental training in youth of the oncoming generations, which take the places of those that are passing away. The subjects taught, and the teaching methods, acquire more or less of a standardization, and attain veneration in the public mind—

*Read before the Chicago Woman's Club, November 8, 1916.

because they *do* maintain our civilization. The curricula become to us more or less sacred, and therefore difficult to change.

But our civilization gradually changes, and perhaps improves. It cannot improve without the methods and substance of education changing and improving also. Education rises and falls and varies with changes in the social order. The teaching ought to be the means of raising the standard; but too often the pedagogues worship the past, are fixed in their methods, and refuse to change until they are forced to it, or, this failing, are pushed out of the schools altogether. Progressive innovations in teaching methods and matter, those that have been potent in raising our social and civic power, have usually met opposition from schools and colleges, which have adopted them reluctantly.

The government of our country is a great, costly business organization—in the main, poorly managed. It costs, for federal, state, county and city governments, probably ten billion dollars annually. One of the largest items of expense, as one of the largest public jobs, is that of education. We spend for public schools probably half a billion dollars, yearly; and the private schools and those of higher education, including the colleges, cost at least a hundred million more. All this to enable us to keep our civilization level or possibly to give it a slightly upward trend; all this to enable our

people to be born and live as best they may for an average of less than fifty years each!

Any sensible suggestion of economy in this business, whether in money, time, human effort or life, deserves the public ear. And, for the purposes of this argument, we must postulate that education ought to equip a child to *do* things as well as to know them; and to be more than a machine to do things, however useful—to attain the highest ideal he is capable of in manhood; to have a wide, useful body of knowledge—besides some wisdom and character.

For vigorous people our educational methods that are venerable and more or less sacred, do fairly well, although many of them are wasteful of time and nerves, are unpractical, and hateful to many pupils. For a large number of weakly or otherwise physically handicapped, bright children, they are inadequate, misfitting, often cruel, and generally inept.

One of the boasted glories of this later time is that we have saved the lives of many children that formerly were lost, and that this is a duty of our civilization. So our average longevity, instead of being as formerly, 30 years or less, is now 45 or more. This increase of at least fifty per cent. is due largely to the greater survival of babies and children, and less to prolonged life of the aged.

But our lives grow more artificial with each

decade; our inventions make living easier in some ways, but in business and work they often restrict us to a narrow range of mental and bodily movements; and some of our vocations are debilitating, even directly disease-producing.

One of the consequences of some generations of this sort of influence is a large number of unvigorous and high-strung children. This is exactly what any thoughtful hygienist must have known would happen, if no countervailing measures were resorted to; and, true to our habits of unpreparedness, no such steps are thought of until the trouble is upon us. Now, an increasing proportion of children have weak bodies with bright minds—weak nerves, muscles, hearts or lungs, too much headache, too little endurance, too much sensitiveness and irritability—too much intellectual precocity.

Quite a number of children are brought to this condition not by prenatal influences,—which is common enough—but as an after result of some sickness that formerly would have killed them, but which they have survived by the grace of modern therapeutics and hygiene. I know there are so-called philosophers who say that such children had better die than live handicapped; and some tribes actually destroy such children. The true philosophy is to remove the handicap—and it is often possible to do this. But in order to do it,

all these children, whatever the origin of their disadvantage, must have, during their growing and developmental years, such conditions of life as will minimize or counteract their abnormal states, and, if possible, bring them to adulthood with at least fair vigor and promise of a career.

Most of these children are capable, under right conditions, of great progress in learning both in and out of school, of usefulness and happiness; and, in well chosen vocations, of a normal life of the average length. Many of the great characters of history have belonged to this class. For their success, as well as to make their lives endurable, they need two things, and these are among their natural rights that ought to be inalienable. One is that they shall gain rather than lose in bodily and nervous vigor while being educated; and the other that in school they shall be taught those things, and those chiefly, that will help them to live the lives, and work at the tasks that they are fit for.

Thousands of boys and girls break down in school and college from the kind and conditions of their study and their irrational manner of living. They have no surplusage of vigor, their diminished supply is used up in their indispensable activities. Some of them drop out for a term or a year and lose their places in their class, then go back to school and try to

keep up with a later class—perhaps to break down again, with all the attendant disappointments and chagrin.

That such things happen is proof that something is wrong with the system. Both the curriculum and the regimen ought, for these students, to be changed. No pupil ought in school work to break down, if he is able to play —this truth is axiomatic. Practically nobody breaks down from over-study pure and simple; but many do from worry, rebellion against their work, envy, jealousy, fear and anger, from worry over examinations and failures; and from grossly improper health conditions in their school life. They have impaired digestion, insomnia and general debility, and as a consequence, they easily acquire various microbic and other diseases. For many of them, the world periodically looks very black; some of them are tempted to commit suicide, and a few actually do. This latter fact is no necessary indictment of these young people; the records of Germany show a many-fold larger proportion of such suicides.

The schools and colleges ought to be like life at a health resort or on vacation, always increasing, never lowering, the vigor of the students. And this is possible with a free resort to common sense, in the light of modern knowledge, and without any serious violence to our educational habits. The schooling of all youths

should be so arranged as to be enjoyable; with the handicapped children this is indispensable.

The best thing for a tired and unvigorous youth is to be thrust into some new environment, out-of-doors to new scenes and experiences, some new sort of exercise or game, something that spurs his enthusiasm, so that each night he comes in with his mind full of the pleasures and surprises of the day, and ready to talk an hour about them. Under such a regime vigor of mind and body is renewed; and the joy of an avid mind, daily filled and refreshed, is as truly uplifting as the outdoor life and the exercise.

I propose that the education of such uncommon children shall be carried on in the joyous equivalent of a continuous vacation. And this is possible while giving them more useful knowledge and training than they can get out of the standard methods; and not less valuable for mental discipline. Best of all, this sort of training fits them for the business and joys of life better than the traditional scheme. School work should always seem to the student to be play, and usually it can be made so.

For the realization of this ideal, several things are necessary. The first step is to segregate the handicapped students, and make a course of study and living for them that is adjusted to their needs. The living must be hygienic in a severe degree, like that of the

athletic team. Every student must have daily exercise—just enough, never too much; if he does not get enough of it from shop, outdoor work and play, he must have selected gymnastics, without any attempt to develop an athlete. High athletic development is beautiful and thrilling for the day, but a harm rather than a benefit for the hoped-for long tomorrow of the individual life. Regular measurements must be made and recorded of each student from time to time, to mark the physical development in all directions; and wherever needed corrective training under expert guidance should be insisted on.

As to food, hours in bed, outdoor life and abstention from stimulants, the rules would be inexorable. Lights out at nine o'clock would become the law, and the hope of the social dissipations, so common today, would have to go out with the lights. This would not exclude wholesome social pleasures, and the sum total of joy would in the long run be greater for the change.

The ordinary school room should, as far as possible, give place to outdoor work and study. This is easy enough in any climate, as has been demonstrated many times over in our northern cold winters. Instead of indoor class work, laboratory, shop and workroom study should, as far as possible, be the rule. They are more educative than the other, and more enjoyable

than any other, with the possible exception of field study. Those studies that are enjoyed most make the most lasting effect on the mind; and it is a mild slander on psychology to say that a study that is irksome is needful for mental discipline. Other things being equal, irksome studies are rarely commendable unless they are necessary to impress the student with the force and effect of law. But most irksome studies cease to be such when they can be taught in a practical way. It is the experience of probably all manual training schools that pupils take to certain studies with great avidity as taught by shop work and tools, when they had previously rebelled stoutly against them as memory studies out of books.

One great need of the students of the past and only a lesser one of the present, is more training of the powers of observation and of interpretation of the things observed. There has all along been too little of this and too much time and attention given to memory studies. The latter rather lessen the power of observation and of doing things, but the course of study here commended directly favors the growth, because it exercises the function, of observation in the most effective manner. The almost total absence of such powers in many so-called highly educated persons is a pathetic vision of our daily experience. The men and women who are the most efficient and success-

ful in the world's affairs are those with the greatest average powers of observation and interpretation. The thoughts that direct and attend physical acts, as in well designed play or certain kinds of work—work-play—are most effective of all in fixing ideas and increasing power; that is, in creating cerebral automatisms—which are the basis of all education.

Why is a farm-bred boy more effective, other things being equal, than the city-bred? His observation and interpretation are keener; he has handled the tools.

The proposed curriculum would contain only a third to a half of the current school-room memory work. The practical, manual, observational and outdoor studies would be greatly increased. For details, I should say that the cutting down of studies would be mainly in higher mathematics, ancient languages and literature, ancient history, certain phases of philosophy, and in formal grammar. Of course, the cut would be adjusted to the needs of individuals; and for vocational requirements a certain student might need exhaustive drill in any one of these subjects.

While a profound knowledge of any one of such eliminable studies may be desirable for a particular student, fitting for a career that requires it, it is absurd that every one should take thorough work in the whole list because one in forty may need to master *one or two*

of them; for the thirty-nine would then be fated to neglect the more practical studies that are vital for their health and success in life—which would be wicked as well as absurd. That sort of defraudation of the many for the few has gone on too long already.

I know there is an outcry against cutting down Latin, Greek and the higher mathematics, because they are venerable and are reputed to be good for mind building, if there is such a thing. But our erudite veteran in educational betterment, Dr. Eliot, years ago saw that we had long overdone the teaching of these and kindred subjects, to the exclusion of more practical, useful and enjoyable ones; and he has stripped naked the fetish that only with these studies rests the power of discipline of the mind. He has for many years constantly urged, and still urges, a wiser course of study. If the educational world has followed him slowly and from afar, it still moves in his direction. And in some quarters the progress is fast enough to satisfy the most radical.

While that younger reformer, Dr. Abraham Flexner,* is a more impetuous and perhaps less judicial iconoclast than Dr. Eliot, we owe him a debt of gratitude for stimulating the teaching profession to keep somewhere near abreast of the activities of the world. Of course, this

*I commend two articles, one by each of these writers, on the needs of education, recently published by the General Education Board.

profession does invaluable service to civilization, but its very business tends toward fixation in methods, language and substance; and this may easily become fossilization. The dictionaries, the school methods and the live languages will not stay as they were—only dead things do that. They are always changing and evolving; and teachers of all classes ought to be progressive, have open minds, and not denounce methods merely because they are new.

The studies added in the proposed scheme would include, among others and in various combinations, Zoology, Biology, Geology, Agriculture, Forestry, Chemistry of Foods and Poisons of the body, as well as the various physical interests of our daily lives; and both personal and public hygiene. There should be some knowledge of surveying for all boys, and of Bookkeeping, Exchange, Banking, Finance and Government for both boys and girls. Several of those studies can be pursued best in the fields, the woods and the mountains. And this fact is a lodestone to pull the most mettlesome students out-of-doors, where they belong much of the time.

Our physical existence depends absolutely on the lives of plants and animals about us, and death finally comes to most of us by some of the microscopic lives. Therefore Biology —the science of life—especially Bacteriology, should be a required study in every school and

college. And it should be studied not from books only, but in the laboratory with test tubes, culture media and microscopes. No other study so much as this arms a youth to defend his own physical life from destruction —and that is the first duty of every one of us. Every vigorous boy is in danger of going wrong in a way to ruin him and later those he loves. This study is the most effective warning.

Vocational study should have a cardinal place whenever possible. All students do not know what their life vocations ought to be or can be; but their fancy and the composite judgment of teachers, parents and friends, should combine to fix tentatively the future vocations of many of them; and these can then work toward efficiency in the lines selected. It is the business of a good school to help them to do this. For very obvious reasons the Spanish language should be a required study.

The sharp segregation of the vocations of men from those of women, is becoming less and less important. Women are taking the places of men in many vocations that formerly they neither sought nor were allowed to enter. The present war has given us many surprises of this sort. There is a brilliant, refined English woman in this country now, who is a major in a corps of women in London, whose duty it is to run to the aid of people injured by bombs

dropped from the air. They go in automobiles which they alone operate. They are able to render every aid that a corps of men could. Every one of them has become an expert in the construction and handling of an automobile. Months ago they were given a dozen broken-down autos of identical construction. They took them all apart, then assembled the serviceable parts into three or four effective machines which they are now using, and some of these have traveled 6,000 miles without a break. Not a man touched a hand to this job. In nearly every city in this country are young women driving automobiles with safety and success equal to men.

There are certain practical subjects that every one should know something about; they are matters of so nearly every-day need and contact that they cannot be omitted from any system broadly deserving to be called educational. For example, every girl should have some knowledge of machinery—the sewing machine, the type machine and the modern automobile at least; she should know how to whittle, to sharpen a pencil neatly, to drive a nail, handle a screw-driver, a saw and a monkey wrench. She should know a lot about domestic science and art in every phase, including the chemistry and nutritive value of foods, as well as the chemistry and physics of cooking and otherwise preparing them. She must certainly learn

about architecture—sufficient to plan a house for herself and know whether she gets the things the plans call for; so she must know about gas fitting and burning, about plumbing, sewerage, ventilation, house-heating and electric wiring and lighting—all of which she will, if she is quite sane, study with both enthusiasm and success if she only has the chance. The melancholy fact is that to most girls the chance never comes.

All boys ought to be compelled to know something about machinery, such as that of railroads, the construction and operation of an automobile, a printing press, and the methods and means of preparing for the market and use of various utensils, fabrics and foodstuffs. They would profit by learning the general and technical workings in some detail of one or two large up-to-date manufacturing concerns. To learn one such thing thoroughly creates the ability to grasp others easily. Can you imagine many boys being *compelled* to learn about such things? The average normal boy jumps at the opportunity to learn them.

The studies here recommended, many of them, take the students out-of-doors, entice them out of the school room, and so help to give the effect of a vacation. They develop the useful power of observation; and with this comes the capacity for invention and initiative. They help to equip any student to earn his liv-

ing by his wits instead of with his hands, and help powerfully to increase rather than lower his vigor; and they send him out into the world with better expectancy of life and usefulness. Wherever these methods have been tried, even in a tentative way, for the children and youths that most need them, they have all promptly shown improvement by contentment of mind, more ambition, better physical condition, fewer physical discomforts and less sickness.

But there are drawbacks to this fine ambition. It will not for a long time be fashionable and so a great many students who need it will dread and refuse it, even if offered to them. Boys and girls hate to be out of fashion, and will endure all sorts of discomforts and privations to get into it—as some boys do to learn to smoke. I have known boys to struggle daily against tobacco nausea for three months before they could graduate as true smokers. The courage of the parents will in some cases counteract the cowardice of their children, and so after a while a new vogue in education may develop. But, alas, a useful innovation does not always or often develop a fashion.

The best hope is that some college may gradually adopt the measures here recommended. It will be easy to do this so far as the studies are concerned, if the college president believes in it, and has initiative and courage. There will be more difficulty with the regimen, the

mode of living. Students dislike to be put on a special regimen not justified by their own superiority, (like that of the athletic team), but rather indicating some inferiority. The young dislike to be called odd, unless that means the possession of an admitted special virtue of some sort, some physical charms that their fellows do not and cannot have, like dimples, a wealth of attractive hair, a tapering waist, or small hands and feet.

Another drawback will be, at first if not constantly, an increase in the expense. More and better teachers with varied education and great tact will be required, and more apparatus and facilities, all of which call for more money. But notwithstanding the cost, it pays. Twice the cost is not too much to pay for such an education for such youths; for it makes for many of them the difference between a large success in life with a fine career, and relative helplessness.

Colleges whose classes are full will, for this reason, as well as because it means an innovation that is disturbing, refrain from making such unusual provision for a group of students. Even the known presence of such students with their peculiar studies and living, might be expected to deter some stalwarts from coming, and that would look like a calamity. But I deny such a slander against the average stalwart student; for he is not a cad, but a fellow

with essential chivalry that he would scorn to boast of.

While the colleges will hesitate, yet any great progress must start with the colleges for the secondary schools will be sure to order their work so as to make their graduates acceptable to the colleges. But the schools could, if they really desired and were paid for it, do better things than they have done for the boys and girls who are not going to college, and these are a majority of their students. Some college, with a true progressive and missionary spirit, will some day start such a work for the good it is sure to do.

If a few colleges—most probably the smaller ones—would begin such reforms, it might by and by become the fashion, and so help to remove the opprobrium that many of the masters of industry have put upon the colleges, namely, that their graduates are useless for the tussle of the world, until they have been taught something useful, by elbowing the world.

The measures here advocated must not be confused with a number of educational innovations already instituted for unusual children. There are schools for the grouping together in special classes of those precocious children who learn or rather remember so rapidly that they outrun the average child. I hope such schools are useful and never harmful, but if you put the slow and rapid memorizers at shop-work

or field-work together, you shall find that the precocity will disappear—wherefore it is a question whether lightning memories are worth much, and whether those who possess them ought to be called super-boys and super-girls.

There are special schools for backward children, which are much to be commended. But the backward children (unless they have actual brain defects) sometimes cease to be such the moment you set them to learning *by doing* something, as in the field or in a shop with tools.

There are outdoor schools for sickly and weakly children, especially those having tuberculosis of the glands and bones, otherwise scrofula. Most large cities have one or more such schools, some of them on the roofs of school buildings. They are in the highest degree useful, but they are mostly designed for the younger children. They help on the convalescence of many of the pupils and give them a good start in life.

But for the considerable class of young people for whom this paper is a plea, very little has been done; a great deal ought to be done, and it is not difficult to do. You could, but you ought not to, create schools and colleges specially for them. If they could have a fair chance in the schools and colleges extant, it would constitute one of the greatest acts of human conservation.

What a vision to behold if the majority of schools and colleges should come to create scholars in the business of life, rather than in the embellishments of a luxury that few of them can ever have! It would be the foreshadowing of a real millenium!

A Presentation Address

A Presentation Address*

This is one of a series of pleasant occasions that have attended the growth and metamorphosis of this school for nearly a third of a century.

Each one has marked some accession of value in its progress from a small affair with varied aims and moderate ambitions, to a concentration of effort on the most ambitious plans for the selection and excellence of the few. Sometimes the acquisition has been a material one, as of buildings, grounds and tools; sometimes it has been spiritual and intellectual. Today we welcome both forms.

The changes in the institution have come through a process of elimination of the casual and easy—designed for the many; and of the engrafting upon it of the more difficult, the more costly—and ultimately the more potent, for the few who can measure up to its requirements.

And the most telling addition of all has been the deliberate movement toward systematic re-

*Dedication of the Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, January 28, 1922.

search—otherwise the search for additions to the knowledge of the world.

We are gathered here to take note of the latest material addition to the equipment, as well as the latest spiritual and intellectual accession. This laboratory is undoubtedly a long step toward an ideal outfit for teaching, and for the research that is in the greatest demand at this time. But no man can guess what new facilities will be needed within a few years, for novel lines of research not now even thought of.

The growth of knowledge comes step by step; sometimes the steps are short, frequent, and strictly progressive; at other times they are long, infrequent, and so radical that one step may require the recasting of a whole science. A hundred such instances in the past stare us in the face, each one having sent a lot of the old apparatus to the scrap-heap. Such may some day be the fate of half the apparatus of this laboratory. If and when it comes it must be welcomed; if it will mean the achievement of vital economies for mankind the exchange will be profitable, and the trade will be a good one. And you will then probably buy new and better apparatus, and go on with your research, but with new angles and for newly discovered purposes.

It was to be expected that such an expansion and elaboration in exacting education would

occur here, on this hill—and with some such an institution as this. For, eons ago Providence, by the forces of the stars, made it certain that some day there would be here a great community of people, capable of such achievements as this movement represents, *provided* the land could be blessed with a stable and enduring government. Ages ago it was foreordained to happen; it was bound to come, and come here—but with the indispensable peace-protecting and industry-protecting government.

Millions of years ago—yesterday morning it was, by the calendar of geologic time—the nearby mountains were lifted up by the buckling forces from below; and the off-shore currents of the more distant sea were then ordained to flow southward, and to flow *cold*. Then it was that the good luck of the low latitude and the right width of the low littoral, made it as sure as fate that here would be a wholesome climate, highly conducive to work and achievement, and that superior people would one day come hither in great numbers —given always a protecting government.

The influence of the mountains and the ocean —the shape and height of the mountains and the currents of air and sea; the width of the plain between, and the fortunate latitude, have made an ideal atmosphere on one lofty spot on the mountain for astronomical study—which study in our time has been realized in astound-

ing fashion. In that day those forces also created here a multitude of engineering problems that were good for instruction, and for a challenge to research by some far-off generation of men. We stand today in the mid-period of that generation; and it would be a shame for us to fail.

Providence seems to have guided the human hands that have developed this institution as it is today. Really, it was a late discovery of a few people that nature had provided here the best conditions to make it the logical spot for a movement of this kind.

The first inspiration came to Amos Throop, a rugged, great soul with a far-reaching vision, who had been enticed here by the natural advantages for health and comfort. He knew how great these advantages are, and he knew that before many decades there would come about in this Southland the rapid growth of cities and the beehive of activity that we now see all about us. He saw that this community needed and deserved the best advantages of education and power. No such advantages had been provided for Pasadena. He had an ideal of a *school* to equip men to *do* things as well as to think and remember. His life had been keyed to practical in contradistinction to scholastic achievements. So he founded a Polytechnic Institute, and gave it all the money he had. By the measures of today the gift was

not large, but it was greater than Mr. Carnegie or Mr. Rockefeller ever gave—for it was all he had. And he did what many givers of money forget to do: he gave himself with his gifts.

From that laudable beginning, this school of high college grade has grown. Now it summons from afar, and ofttimes invents, tools for its art unheard of before; and it calls from the ends of the earth the ablest experts into its faculty. Moreover, men famous in science come here to pursue further research with its facilities, under the inspiration of its work, and in the midst of its many advantages.

With all this development, the Institute has never departed from the original ideals of Mr. Throop ("Father Throop", as he was lovingly called) that it must in the highest degree possible give an education that shall fit men to *do* things in this rushing world of useful achievements—and a new civilization.

The new laboratory is the latest step in this practical direction, but by no means the last step. It is being equipped with all the practical things its designers could think necessary—but no human mind can foresee what new machinery may be needed on tomorrow—or some other morrow. In this particular, the end is not yet; and the equipment will never be finished. It will always be growing and changing.

Another inspiration came out of a search for a good place for a Carnegie Observatory for the study of the sun and other stars. Should it be located here or across the sea; or across the equator? It must be put in the best place —for millions of money were sure to be spent upon it. The incomparable Director of that work soon demonstrated the natural advantages of Mt. Wilson for the observatory. More than that, as this region bristles with scientific problems and interrogation points, he saw that here was the place of election for a great scientific school of the future. It not only belonged here, but it would be a wholesome neighbor to the Observatory. Then it was that Dr. Hale consented to become a Trustee of this corporation, on the condition that the Board should fix a standard for the school, a little higher than that of any other then in existence. The Board, under the enthusiastic leadership of the then President, Dr. Scherer, promptly accepted the challenge; and it has, I believe, kept its promise, and maintained the condition.

But the plans for this higher emprise could not have been carried out, but for the vision, faith and unfalteringness of the Chairman of the Board, Mr. Fleming. His wisdom has, if possible, exceeded his determination; he has asked for other large gifts and got them; and, like the true soldier he is, he has led the

way by making larger gifts himself. To use a colloquialism, he has been for years the very "angel" of the Institute. He does more good things, and talks less about them, than anybody else—and I nominate him as the most useful citizen in this community.

The evolution of a great laboratory is an absorbing subject—absorbing both in interest and money. Two years ago a laboratory of the physical sciences became a vital need of the Institute, if it were to go on in its progress without halting. It required a large expenditure of money. Some folks at our house, who had watched the growth of this movement from its beginning—and helped through its first two decades and more—had for long expected to do something more substantial towards its perfection than they had done before. Of course they knew of this urgent need and opportunity. But they were unable to see how they could provide even a small laboratory without losing so much time that opportunities and treasures of the first order were likely to be lost before the building could be completed. And the need was for a *great* laboratory, not a small one. Then a new light dawned, a hint from a genius, and the laboratory began to take form as a reality.

The program of this occasion says that the presentation of the laboratory is to be made by the donor. It ought to have said *donors*. For

myself and Mrs. Bridge, some personal facts should be stated here; and one of them is that I appear here rather under false pretenses. We could not have rapidly provided this magnificent and elaborate structure without the influence and connivance of that remarkable man already named, the wise and unselfish Chairman of the Board of Trustees. So, constructively he is in very essence one of the donors. Without his wisdom and faith, this building could not have been provided in time to function early, and early to embrace the greatest opportunity the institution has ever had. And as I am speaking in the presence of —as well as at—the head of the governing council of the Institute, who is also the Director of the Laboratory, I will, at the moment, spare his embarrassment by merely hinting at what that opportunity was. This community and the educational world are fast finding out what it was; and if God and the fates spare his life, they shall in good time realize it completely.

For myself, I beg to make a personal explanation and a confession—wherein may appear the evidence of the amazing vacillation of man. I had long protested that my name should not be given to any endowment of anything that I might ever make; I protested against the use of it on this laboratory building; and the arguments of members of the Board and other friends, including the Director of the Labo-

ratory himself, failed to move me in this particular—until I found that the vital member of my own household, who had for half a lifetime helped toward this opportunity, was in league with these people—then I surrendered. And I am ready now to confess to one comfort in seeing my name chiseled over the chief portal: it ought to tend toward discouraging the public from longer trying to impose on my name a final *s* and a middle initial!

As to the material contributions toward the building, they are made with utter gladness, with the knowledge that here shall develop a great center of education and research that will give the start and found the careers of many of the scholars and super-engineers of the future—and make life easier and more joyful, as well as more worth living, to vast numbers of people—for the men who are graduated here will carry the torch to others, and they to still others, on through an endless succession. Certainly no gift of mine already made, or that shall hereafter be made here, can possibly be a measure of my faith in this institution, and I have not for years had any official connection with it. My faith in it is greater than if I had a hand in its management.

Finally now, and in behalf of the donors and all the friends who have encouraged this consummation—those who have hoped and prayed for it; those who have planned and designed it

and watched its growth; and those who have devised and furnished the sinews of construction that have made its walls rise into being—in behalf of all these and in their name, I commend and present this Laboratory of Physics —the last and best word in a modern workshop of nature's philosophy, to this Corporation, and to you, Dr. Millikan, its Director—to you, sir, who embody in your person the new spiritual and intellectual gift that comes with the Laboratory. And you are the hope and sure promise of the future!

Ephraim Fletcher Ingals—
The Man

Ephraim Fletcher Ingals—The Man*

It must be nearly thirty years ago that as Dr. Ingals and I attended together the funeral of a friend, he said to me: "This service will get around to you and me by and by—soon enough." Much water has passed over the wheels since that day for both of us. And now—after a friendship of more than forty years—I am privileged to speak here of his personality and life, as I am sure he would gladly have spoken for me had I preceded him.

My relations with him began when we joined a group of young men who entered the teaching staff of Rush College in the early seventies of the last century.

Almost from the first that group advocated more and better teaching of the classes and more severe conditions of admission to the College. And some of them helped finally the affiliation with the University two decades later. Dr. Ingals led all the rest of us and exceeded all by his courage and faith in this movement.

*An address delivered at the Commencement of Rush Medical College of the University of Chicago, June 12, 1918.

Only two of that group of young men now remain; and they, by their bewhiskered grayness, show the younger generation what these last are coming to. Most of the group entered this work without having earned an academic degree, and Dr. Ingals was one of the majority. But since that time colleges have been led, in unguarded moments, to decorate some of these men with complimentary degrees—myself among the number.

They had the optimism of their years and blood, and the temerity of reformers. They insisted that medical education in this country must be improved with pedagogy in general, and that premedical education must become respectable, which it was not with most colleges at that time.

Many of the senior teachers—grand men for their day—opposed anything beyond the most slowly developing reforms. They held to the doctrine of conservatism, and feared novelties that meant severity in conditions of admission and graduation—for that would be sure to reduce the classes and the income—and there was no other income but that from student fees. Those were the days of the so-called proprietary medical colleges all over this country.

But the reforms were bound to come; many and varied influences were soon at work to push the good cause forward. Before long some momentum was gained, then speed in-

creased; and finally came for this institution the affiliation, and with it the benefits of university standards and association, and the inspiring force of that missionary of higher education, the President of the University.

It was the old story of the ship builders. Men said that iron ships could never supersede wooden ships. Their children said that steel ships could never take the place of iron. Now we are skeptical about concrete ships—which may yet displace the others. Many of us declared that practical flying machines were impossible, but American ingenuity and petroleum have confounded our disbelief. The progress of our profession in forty years has outdone the airplane in wonder, and far outdone it in beneficence.

Dr. Ingals had a sort of preparation for life that at first he was unable to appreciate. It came to him in part from his forbears who gave him toughness of fiber, clear and straight thinking, and best of all, the determination that fitted him to tussle with a lot of elements which, because they were obstacles, developed in him power to overcome greater ones.

But there were other forces. He was in his youth a farmer, and learned to use a hundred different farm tools and utensils. He went through a great rural manual training school without being aware of it or of its value. He had learned some dozens of different processes

of farm work. No wonder he found new devices and tools easy to master in his profession.

These gifts it was that enabled him the other day to finish a career as physician, teacher, organizer, citizen and neighbor, which his family, his friends and the community may well be proud of.

He came of good stock from far back. His people were stable, thoughtful, working folk; and he, as they, came up through industry, frugality, temperance and self-respect. He early learned the value of a dollar; he learned that and other good things in his industrial school of life, all of which helped to save him from many pitfalls afterward.

He was marked for success from the start, and those who knew him as a young man, knew he would rise if his life and health were spared. His education was good, if not classical, and it was a continuing process for half a century. Some of it was gained against a painful handicap that for several years threatened him with blindness.

He had an ambition to succeed by his own efforts—he had what we call grit and tenacity; and these traits colored his entire life.

He had decided opinions on many subjects which he often asserted with positiveness, but he neither shouted nor paraded them. He spoke in gentle tones which rather added to

his impressiveness. At times he may have appeared to some as rather insistent and uncompromising—but that is a charge that is laid at the door of a host of successful men who have helped to move this human world forward.

He had a sense of humor, but it was not an intense one. He enjoyed but rarely told amusing stories, and never in my hearing one that he could not tell to his wife or his daughter. And I never heard him laugh explosively as many men and women do—often on slight occasion.

It is refreshing, amid the grandiose flare that is so much the fashion of our time—the waste of energy in spurts of ostentatious effort, to see a man go with quiet continuity about the purposes of his life, and succeed steadily, and make the fewest mistakes. He succeeded by no haphazard process, but by persistency with thought, strategy, even finesse—and often with compromise. I have recently re-read some hundreds of letters received after my expatriation to California in 1891, and have found a large bundle of them from Dr. Ingals, in which he described, among other things, negotiations in the interest of the College. Many treat of his hopes and plans for affiliation, and describe minutely many conferences, and discussions of ways and means, and emphasize the mutualness of the interests of the College and University. No man could have been more consistent or

persistent in such a constructive purpose. These letters are a fine exhibition of continuing friendship and of personal philosophy.

Few men have ever more effectively than he programmed their lives. His hours were organized for efficiency; and for many years his working day began when his neighbors were still snoozing in bed, and before the sun was in sight. He more often saw the sun rise than any other doctor I ever knew. The Congress has passed a daylight saving law to effectuate this economy by the fiction of moving the clock forward an hour. Of course, the more natural way would have been for the people to resolve to get out of bed an hour earlier; but they could not be trusted to do that, so the Congress took advantage of their fixed habits and saved them by the trick of outraging the great time-keeper, the sun. Dr. Ingals needed no such subterfuge for the conservation of *his* energy.

He was always busy at something; and as he worked systematically he rarely seemed to be in a hurry. He could do a large professional business, lecture in the College, attend a hospital, have some medical writing on hand all the while—a book or a society paper—attend to his secular business; and never seem to be in haste. He spoke deliberately, worked and acted rather slowly; but he arrived. It is a habit that vast numbers of men and women

need to covet. It saves energy and prolongs life.

His professional work was always recorded; it was not trusted to the treachery of memory, but went down in case records by his own hand or that of his assistants. Some parts of these records were in abbreviations and signs; and often they were in several handwritings, but they served the purpose. Thus his work was free of the slovenly hit-or-miss faults that have been so common among doctors. Moreover, his records were the basis and material for statistics on which to found better study of pathology and diagnosis, and for better treatment of the sick.

In 1875 in Chicago two medical journals (the *Journal* and the *Examiner*) were united into one, and named the *Chicago Medical Journal and Examiner*. It was under the nominal editorship of the late Dr. Byford—the real work being done by four young men (Drs. Etheridge, Hyde, Hotz and Bridge) who took turns in getting out successive numbers of the paper. Fancy a monthly publication changing its editor with every issue for four months in succession—and then repeating the process over and over! Of course it was sure to work badly; and after a year or more of this absurd program, the details were all given into the hands of Dr. Ingals and the quartet retired. He did the work in a painstaking and efficient

manner for several years. Then his growing medical practice compelled him to relinquish it. He gave a great amount of time to this service—but it was not wasted; for it fixed in him a habit of writing, a critical sense in the use of language, that gave such a forceful simplicity and finish to his style, as to materially add to his fame.

He was a superior practitioner; he was exceptionally deft in his operative work, and above all he was imperturbable. He was never stampeded by the accidents or surprises of a case of sickness or surgery. What a gift for a doctor to have!

He devised numerous instruments and operative procedures. And some of these were rather startling. As I have seen him slide instruments through the larynx, far down the trachea into the larger bronchi, and fish out foreign bodies from the lungs, I have thought of the lady that a doctor friend used to tell of, who at her first encounter with a laryngoscope, asked the operator how far down into a human body he could see with that machine. And he replied solemnly, that he could see the cane seat of the chair on which she sat. "Then," said she, "please take a look at my liver." I am not certain that our late friend was not that laryngologist.

Dr. Ingals helped to redeem the reputation of our profession in the business world. We

doctors have been classed with preachers, artists and women, as generally incapable of business judgment. Our business failures have been advertised; our speculating, skyrocketing ventures that came to grief have been recounted and exaggerated. And if one ever made a signal success in a business way, it was attributed to either luck or shady methods.

But professional men are capable of business sense and honor; and that a man's chief vocation is the study of the human body, and how to prolong its life and lessen its sorrow and pain—is no reason why he may not observe the business world about him, and profit by the habits of men who make successes by sound methods and with a minimum of failures. This Dr. Ingals did and he succeeded. And, too, he proved that wealth is not discreditable provided you do not make a bad use of it; and he had the sense to avoid the besetting weakness, the ofttimes fashion of riches, which is the ostentatious display of them.

He was for many years the comptroller of Rush College and held us all rigidly to the rules and the budget. He confirmed safe business methods for the institution, that have commended it to the faith of the public, and made more easy the raising of the vast sum of money gathered together recently for the creation of a greater center of medical study under the wings of the University. He deplored waste

whether in public, in institutional or personal affairs—and that, when not carried too far, is a good sort of caution for a guide.

His success was not fortuitous; he was no accident. His life was planned with the most deliberate method, and in a way to be a type and model for youths in general, and especially for all young doctors who have courage and will-power. They need these, as they need to be stoics when the peltings of the storms of life come, and when pain strikes the mortal body. Then especially they need to have power to exteriorize their minds, and to force themselves to work on and on. This he illustrated always, and with astounding heroism through many of his later months, when he knew that the pains he suffered forespoke for him a death that might come at any moment. Yet he worked on, amused himself as he could, played golf, entertained his friends, and wrote for his brothers an account of his case with a discussion of the disease—which was read at the Institute of Medicine a month before he left us.

He did more than this. When our nation declared war, he was anxious, despite his infirmity, to have some part in the struggle, and so he accepted a commission in a corps of medical men advisory to the Surgeon-General. And the most precious picture of him that we have is not in a professorial gown (which always much became him) but in the uniform of

a captain in an army engaged in the holiest war ever waged. He has there his usual look of quiet firmness, and the appearance of a man of half his years. He was glad of this opportunity to help, if only in a quiet way, toward the one inevitable, awful consummation in this world fight—as he was proud that his son was accepted in the corps that involves the most skill and hazard.

Dr. Ingals was not a genius. We do not need geniuses, and could get on for a few centuries without any more of them; for they usually have unstable nerves and mental powers. But he had a genius for building on a good foundation, and he *knew* a good foundation. He had large talents which he neither buried nor kept idle.

He was not an orator. He could never have been a spellbinder, nor did he desire to be. Heaven spare us from most such, and from those who think they are orators. He told his message in plain words that were understood, and some of the things he said and did were eloquent without his knowing it.

He did not pose as a literary man, yet he materially added to the solid literature of the profession by some standard books of permanent value, and by a swarm of brochures of like excellence—and all written in faultless English.

He was the last man to emphasize his own virtues, but his life—professional and per-

sonal—was founded on the ethics that belong to a gentleman, namely, a due regard for the rights and feelings of others. This is the basis also of the best ethics of nations. A Mexican Indian, Benito Juarez by name, years ago gave an apt definition of peace when he said: "It is the condition where each people is careful to respect the rights and feelings of every other people." This is a doctrine for men and nations in all times. And it is the rule especially for us in this perturbed and anxious year of grace.

Dr. Ingals had the qualities of true greatness—greater because they were unconscious—and his career justified his qualities. We need more men of his stamp.

The material and moral fruits of his pilgrimage came to him naturally and as a matter of course, and came with no shadow of sordidness; they were glorified by having been both earned and deserved. Beyond all these, his incomparable wife, who was in all the years his greatest help and strength, and next to her their four stalwart children, were his greatest rewards of all.

In the ripeness of his years his journey halted. And with all travail, in the end he could say with Joseph of old, who gave him his name of Ephraim: "For God hath made me fruitful in the land of my affliction."

Henry Bachman Stehman

Henry Bachman Stehman

On February 17, 1918, there died in Pasadena, California, a modest, gentle, great man, whose career as citizen, physician and philanthropist was unique.

He was born in 1852; was graduated from Lebanon Valley College in 1873—receiving there later the A.M. degree.

He was a student at the Universities of Leipsic and Brussels from 1873 to 1875; and he received the degree in medicine from Jefferson Medical College in 1877. After this he served an interneship in Blockley Hospital.

In 1881 he married Miss Elizabeth Miller. He became superintendent of the Presbyterian Hospital of Chicago in 1884, and so continued until 1899, when his health broke down and he resigned and moved to Pasadena.

He never completely recovered; but he got better, and before long began some professional work, which he continued, under the handicap of physical suffering, until shortly before his death—and he died the most useful citizen of the town.

He was never content to be simply and

merely a practising physician, but his avocations in philanthropy, public benefit and religion engaged his mind and heart constantly. He was a man of broad and sane vision, and the work he undertook he usually accomplished. He had a constructive mind and a genius for organization, which had scope in two hospitals—one in Chicago and one in Pasadena—the building of a great church in Pasadena (of whose Finance Committee he was Chairman) and finally in a monument to his zeal for service, La Vina (The Vineyard), a sanatorium for tuberculosis, situated to the northwest of Pasadena.

As a hospital manager he was superb, and in procuring funds and endowments for hospitals he was something of a genius. The Presbyterian Hospital received through him many gifts—endowments of beds, wards and rooms, and bequests of large amounts.

He chiefly designed the interiors of several buildings of the Pasadena Hospital and he assisted in securing large gifts for this institution.

La Vina (Vinya) was his greatest work. On a farm near the mountains have arisen some eighteen buildings for the housing of a hundred patients. The farm and the buildings, and all their belongings, have been the willing gifts of those who believed in the man and his work.

It was his ambition to create here a haven of

rest and care for a few of the many consumptives who walk the streets as long as they can—and walk in loneliness and desolation. And this he nobly did.

For ten years, in the midst of an exacting practice of medicine, he gave himself to this service as a labor of love, refusing all material rewards of any kind—even declining gifts for his personal comfort and relief in this work.

While in Chicago he was for eleven years a successful teacher in Rush Medical College, finally as Assistant Professor of Gynecology. He was an expert diagnostician, and a resourceful surgeon. He had the fine art of helping the sick without irritating them.

He had a genius for raising money for a good cause, and he did it without annoying people. He rarely asked for money directly; rather his friends and acquaintances enthused with him over what money could do for a good cause—and the money came without being asked for.

His religion he took more seriously, and with less parade than any other man I ever knew. His relations with others were always kindly, unselfish and helpful. His purposes in life were too serious for him to waste time and energy over trifles; these he took with rather amused philosophy that saved him from the harm of irritation. The power of his unobtrusive personality, like a rich perfume, touched

the spirits of those about him for their strength and comfort.

His life was consecrated to the weal of the sick and needy of all classes, of all religions and no religion. He respected the sincere opinions of others, on any and all subjects; he was never captious or disputatious; he was beloved of all who knew him and of him. And in his final protracted agony, he had the sympathy and prayers of the churches of all the religious orders in the city, and of the community in general.

On the History of Oil

On the History of Oil*

For many centuries beds of a hydrocarbon called asphaltum have been found in numerous places on the surface of the earth. Before recorded history began, this substance was used in the arts and industries in a small way, for waterproofing and for sticking things together. It has come in our time to be used in enormous quantities, largely for paint, waterproofing, roofing, pavements and road-making.

Likewise in numerous places in many countries little oozings or seepages of petroleum (also a hydrocarbon), have been known for centuries, even from long before the Christian era.

It was a long time before it crept into the dull brain of man that the asphalt *is* petroleum, which has lost by evaporation its lighter products, and become hard. That fact means that seepages of oil must have gone on continuously for milleniums of time, for some of the asphaltum beds are deep, broad and very hard.

In America petroleum was mainly a curiosity for over a century. It was used in minute quantities as medicine (for some imagined

*Read before the Chicago Literary Club, November 1, 1920.

quality it does not possess), for illumination, and perhaps occasionally for heat. Finally some one conceived the idea of drilling holes in the ground near the seepages in the hope of getting more oil. He succeeded—then drilling became common; the fashion grew. That was within the memory of many people now living. For the past sixty years petroleum has had a rapidly developing career of power and usefulness, until now it is more widely used and needed than any other substance (not food), with the possible exception of iron and coal. It has become responsible for vast new industries all over the earth, and it has changed our civilization, as it has revolutionized the commerce and the warfare of the thinking world. We are in a petroleum age, as the world has for long had a coal age and an iron age, both of which changed the civilization of the race.

The drilling of oil wells, the carrying of the oil by pipe lines, and its distillation into numerous products for use in commerce, have become and constitute one of the great industries of all time. Vast fortunes have been made out of it—a few only; the majority of investors in oil have made little. Like mining for gold and silver, so in mining for oil—for it is mining—the majority fail; the minority succeed, and a few succeed greatly.

Petroleum has been found in many countries,

and will probably be found in many regions only dreamed of at present. The stuff is generally struck in quantities from a few hundred to over four thousand feet below the surface; and the accumulated hydrocarbon gas mixed with the oil (and clearly a product of it) has sometimes attained such a pressure—up to 1000 lbs. to the square inch—that when the drill penetrates the reservoir of oil, the gas and oil gush out with great force, throwing tools many feet into the air and even bringing up the casing out of the well. This causes vast havoc at times, and great loss of oil—both increased if perchance the gas takes fire. Then it requires genius, energy and large resources to put out the fire, and shut off the flow of oil. Sometimes this feat cannot be done, and the well must be allowed to burn and flow itself out, often lasting for many weeks.

The first production of some of these gusher-wells is fabulous—in one instance it was 260,000 barrels a day by actual measurement; and the stream of oil rose 500 feet into the air, as shown by triangulation. The high production of a well usually runs down rapidly from the first, and after a few weeks or months reaches a moderate production, which may be maintained for a long time, a dozen years in many cases, occasionally a quarter of a century. These long-lived wells usually require to be pumped after a few months or years.

The oil in many American fields is found in saturated beds of sand of varying thickness (sometimes hundreds of feet thick). These sand beds are underlaid and overlaid by hard shale or other rock formation. These beds extend laterally sometimes for many miles—often nearly, but not quite, level. More or less of the sand comes out of the wells with the petroleum, in some instances to the extent of hundreds of tons; this piles up in the large sump-holes made by the side of the derrick to receive the oil.

Sometimes two or three beds of oil sand are known to exist superimposed one above the other; there may be, and probably in certain fields are, more than three such layers situated beyond the reach of the longest drill machinery. These sand beds are separated from each other by hundreds of feet of hard shale, which usually prevents any movement of oil from one sand layer to another. But earthquakes may crack the shale and rock which separate the sand layers; then the oil might leak through the cracks, and would if the pressure were greater in one layer than in another, and might ultimately be found miles away from its original abode. The surface seepages probably flow through such earthquake cracks. Like water, the oil travels in the direction of least resistance, and it is certain that some oil deposits have, through the millions of years since they

were formed, occupied two or more widely separated locations. As a result of such changes of location of oil, there are mountains of hidden and exposed shales—of a bluish-gray color—more or less saturated with invisible oil that was absorbed from previously existing oil deposits— and where no tangible petroleum may have existed for a million years. The petroleum may some decades hence, be profitably roasted out of these shales for commerce —after the easy oil-mining is done with. There are a few shale distillation works that are now operating, but not with much profit, except where transportation charges and conditions protect them.

Anyone unfamiliar with the subject can test a shale for oil by the simple process of dropping a piece of it as large as a bean into a large test tube, and holding this over a flame. If oil is present, it will soon blacken the inside of the test tube and produce a sputtering sound, with a distinct odor of petroleum.

In Mexico and other regions the oil is mostly in non-sand formations—so that a well may produce millions of barrels of oil (70,000,000 in one case), without a bushel of sand or other debris.

Oil producers naturally develop first their largest yielding fields. Nobody will hunt for a small pumping well when he can get a gusher; and gushers have been found in many fields so

readily, and production has been so great, that extravagance and wastefulness have shamefully beset us.

Water fills the interstices in the earth crust down for hundreds of feet below the surface. Petroleum in the ground is always lighter than water, and as the oil is exhausted water takes its place. So, in a way it may be said that the oil rests upon the water. Sooner or later the oil wells run to water. That means that water is first mixed with the oil, then displaces it entirely. This process may extend through years; half shutting-in the well will keep back the water and allow more oil to flow. A little water does not spoil the oil for certain purposes, as for burning under boilers. If the oil is light in gravity it may be easily separated almost completely from the water, and then can be used for distillation, or for any purpose.

The phrase "boring an oil well" is often inaccurate; for most wells are made by the pounding of heavy drills, attached to steel rods in a combination that sometimes weighs a ton or more. Steel wire rope and powerful machinery lift and let fall these ponderous drills hour after hour, night and day, for months together—with occasional interruptions to clear the debris out of the hole, to add new joints of the lining casing, and to move the whole line of casing up and down to make sure that it is movable and not "frozen"—that is,

not stuck fast. The driller has his hand on the rope or its attached machinery as it rises and falls, and he becomes expert in telling thus by touch the behavior of the drill, as it pounds the bottom of the hole, perhaps a half mile down in the earth away from him. An Irish laborer once made an apt remark to a driller on seeing him keep his hand on the rising and falling cable. He said, "Be gorra, an' you are a long way from your worruk."

In a minority of cases the rotary or revolving drill is used, of course in earth formations that are adapted to it. This is a more rapid and cheaper method. It works well in soft and horizontally stratified formations; not in hard or upturned strata.

Oil wells cost variously from ten to one hundred thousand dollars each (average say $35,000), including, of course, the metal casing that lines the hole. Tools occasionally are lost in the well, entailing days or months of time in attempts at fishing them out. New grasping tools may have to be invented for the special case, and the greatest amount of skill, ingenuity and long-headed wisdom are often needed to extricate the tools; and sometimes this is impossible, and the well must be abandoned.

Woe be to the well and the drillers, and oftimes to the treasury of the owner company, if the hole becomes crooked. For then it must

either be straightened, which requires endless patience and rare manipulative skill on the part of the driller, or the well must be abandoned, the derrick moved some distance away, and a new hole started. All this costs money, and a great deal of it.

The selection of the place to drill a well with prospect of finding oil taxes the highest skill and knowledge of the oil prospector. The outcropping of sandstone, the cracking of which may reveal dark stains and possibly a slight petroleum odor; the contour of the surface, and knowledge of the local stratigraphy all help, especially the drilling experience of near neighbors. But the drill itself is the only unerring witness; and dry holes are extremely wasteful of money—and prospectors are often poor.

The distribution of petroleum under the earth's surface is extensive over the globe. It is a profitable quest in many States and countries, and it is found in small and unprofitable quantities in more regions probably than have commercial findings. Indeed, except in the earliest and hardest rocks, it is altogether probable that you could find at least traces of petroleum almost anywhere you might drill to a depth of say a mile (5280 feet). It is found in profitable amounts in many high altitudes—as in our States of Montana and Wyoming, and in Canada. This shows that although it

must have been deposited or created in the same way as on the lower and leveler stretches, the formations have, in the buckling of the earth's surface, been lifted several thousand feet into the air, yet not all the oil has succeeded in leaking away from perhaps its orginal bed—the bed and all the rocks about it have been shoved up together, without losing all their precious contents.

Petroleum has been mined under the sea—near the shore of course; but flecks of floating oil on many oceans have proven seepages to exist beneath the waters.

A subject of great speculative as well as practical interest is the conditions and method of the creation of the petroleum from the beginning. When, how and where was this product formed? Several theories have been offered, and hot discussions have gone on about them for many years. The chief of them are: (1) that chemical and physical conditions deep in the earth have produced the hydrocarbon substances; and (2) that the oil has resulted from the dead bodies of the astounding sea fauna of some thirty million years ago, under the influence of time, heat, pressure, and probably other physical as well as chemical forces. The proof so far seems to tip rather in favor of the dead-fish theory, although there are some ingenious and sound arguments in favor of the other one.

And possibly both methods are responsible

for the occurrence of petroleum. A great amount of research work has been done on this problem, and a library of papers and discussions about it has accumulated. More than twenty well equipped investigators have worked on the theory of inorganic origin. One of the most fascinating theories is that of Kizhner, based (as he says positively), on experiments which show that petroleum may be produced by: "The interaction of hydrogen with carbon, both of which are held in solution by the iron existing in the bowels of the earth. This interaction began when, in the process of cooling, the earth reached the state of a red star. The difficultly fusible iron and carbon liquefied and solidified first, and, owing to its high specific gravity, the iron holding in solution the hydrogen, settled at the lower strata of the globe. Owing to the high temperature prevailing in the depths of the earth, the reaction between the iron and the carbon has been going on for ages and *is doubtless going on now*. The comparatively low specific gravity of the hydrocarbons causes them to rise as naphtha (petroleum) to the surface, passing through various strata, which modify its character" (Bacon & Hamer). This theory seems reasonable, and it gives hope for the future. I for one am glad to believe it.

If we creeping humans are not restricted for our sustenance and comfort to the products of

the skin of the earth say, a mile in depth—but if we draw and are fated to continue to draw treasures unspeakable from far greater depths—as Kizhner indicates—perhaps many miles into the "bowels of the earth," where a creative process "has been going on for ages and is doubtless going on now"—then it argues great luck for our civilization, or the amazing and beneficent designs of the Almighty.

The changes in the manner of living that have come about by the development of petroleum as an article of commerce—as already said—are both radical and startling. We are living in a petroleum age that is as distinctive as was the iron age or the age of coal. And the oil influence grew slowly for a long time, then in two decades it burst upon the world and changed many of our habits, and put into our hands powers of the most phenomenal sort, and made possible a war involving many nations of men, and of unprecedented destruction of life and treasure.

Iron attained its influence and benefits slowly. In India and Britain in ancient times a little iron was reduced from the black oxide. Cast iron was known four or five hundred years ago. It was early learned that antimony melted with iron ore would reduce the melting point of the iron. This made it more practical to produce cannon; and the first cannon was made of cast-iron about the middle of the 16th century.

Ordinary iron castings appeared a century and a half later, i. e., the beginning of the 18th century—to be exact, in 1706. The Romans in Britain for a long time made iron by smelting the ore with charcoal. But eventually the forests seemed in danger of being destroyed to provide charcoal. In 1618 pit-coal was first used for smelting iron ore. There was no question that for the sake of economy this ought to have become the prevalent, if not the sole, practice; but the ironmongers were accustomed to the charcoal-produced article, and refused to use the pit-coal product. So, for nearly another century (to 1710), the decimation of the forests went on to make charcoal for smelting. Finally this had to cease. The pit-coal product was probably inferior any way, but it had to come into use. Iron smelting then decreased for some fifteen or twenty years, when it was discovered that coke can be produced from coal. This made iron smelting easy; and the great iron age then (1740) began as a commanding influence in the commerce of the world.

The Watts engine came in 1770. Puddling and rolling of iron began in 1784. The hot blast came in 1830, Bessemer steel in 1855. Then the great phenomenon began—and railroads, power plants, ships, steel buildings, engines of construction and destruction, and a thousand lesser industrial uses, have changed

more or less the course of the lives and living of all civilized peoples. They have changed the economics of life.

Coal has all along been the ally of iron in the advancement of mankind. The development of the steam engine gave coal its greatest usefulness, but coal was a long time coming to its maximum work. It had been used as a fuel since long before the Christian era. It made possible glass manufacture early in the 17th century (1619), but not till steel and the steam engine were developed did its enormous push come about. Bessemer steel came in the middle of the last century, and a quarter of a century later the United States mined in a single year forty-seven million tons of coal.

Thus both iron and coal by a few inventions for their better elaboration came into power with a rush. So it was with petroleum, and the increase in the use of it for the last half century has been phenomenal—its consumption has now reached seventy-five fold of the figures of 1870. The greatest jump was during the first decade of this century, when the production in the United States bounded from over 60 millions of barrels (42 gallons) anually to 376 millions per year. Today we are producing at the rate of nearly, if not quite, 450 millions of barrels[1], and we are importing from Mexico at the rate of over 90 million barrels annually.

[1] R. L. Welch.

Yet we are trying to consume and send abroad more than we are able to produce, and more than we can get. And all over the world oil men are drilling the crust of the earth as never before, in trying to keep pace with the demand —and unsuccessfully.

There are today twenty-one countries producing petroleum. Seventeen of them produce over 35,000 bbls. each, annually. The United States produces about 69 per cent. of the world's output, and we are supposed to control about 18 per cent. of the oil still underground. We ought to control much more, considering our size and importance as a nation. But some 17 nations have laws that discriminatingly restrict us from operating within their borders —while we have no such laws. Foreigners have acquired vast holdings of oil properties in this country, which they are exploiting to their profit.

We have increased our production of oil five fold in the last twenty years; but the demands have run even faster. Automobiles began to be practical twenty-five years ago; now we have in this country 7,500,000 of these machines— and they have increased nearly or quite nineteen fold in ten years, while tractors have increased fifty fold in the same time, and now we have 300,000 of them. The United States Shipping Board has a lot of oil-burning ships—they need 40 million barrels of petroleum annually.

Some of the great ocean liners are being transformed from coal to oil burners, and oil burning ships are still being built. From practically no production twenty years ago, Mexico has an output now at the rate of nearly or quite 100,000,000 bbls. of petroleum per year —and we get the major part of it. Still there is not oil enough to go round.

Nearly all the lubricating oil of the world comes from petroleum. It could not be produced in any other way, and when this source runs down the amount of machinery of the world will shrink correspondingly. We are making the astounding figure of over 20,000,000 bbls. of lubricants per year in the United States. That would fill three hundred of the largest tank ships—a twenty-five mile string of vessels.

A glance at the system of oil pipe-lines in this country shows the enormous size of the industry. There are 34,000 miles of trunk lines and over 11,000 miles of gathering lines in the various fields, making a total of over 45,000 miles of pipe. The cost per mile of 8-inch line in pre-war time was about $6,500. Pumping stations cost from $130,000 to $250,000 each.

We have made some progress toward economy in the production and use of oil, and still more economy is needed. A vast amount of gas comes off from the wells with the oil.

This gas contains a good deal of light gasoline —called "casing-head" gasoline. Now by various methods much of it is saved; formerly it was mostly lost. The saving amounts to many millions of barrels annually.

From some of the gusher wells of the largest production and highest pressure, the amount of gas discharged amounts to many million cubic feet daily. This becomes a matter of large profit if the gas can be utilized, and of peril to people and animals if it must be discharged into the air.

As a matter of fact, in some cases, it is impossible to utilize more than a small fraction of the gas, and the surplusage is piped away to a safe distance and burned from tall stand pipes to get rid of it. I know of some hills in far away regions of Mexico where flames of this sort have for years continuously lighted the country round about—a pathetic notice of a so far unavoidable wastage.

The loss from crude oil and gasoline by evaporation makes in the aggregate an enormous item, and better devices are needed to lessen it. Our U. S. Bureau of Mines estimates that our present loss by such evaporation costs us 150 million dollars per annum.

One great hope for economy in the use of petroleum is the Diesel Engine. This is a true internal combustion machine, that burns light crude oil or 25 gravity (Baumé) distillate, and

works well, if not perfectly, although requiring more skill to handle than the steam engine. It is adapted to all freight and other slow-going vessels, and to stationary machinery. And, rightly used, it multiplies by three the power production of the oil as compared with burning it under steam boilers.

Something more must be done to prevent the present trend of exhaustion of our oil supply, without catching up with the demand. Lately there has been noted a slowing down of the excessive use of gasoline in automobiles. A great many of the pleasure cars ought to go out of commission. We need to recede a little (or is it advance?) toward simpler lives—and fewer automobiles.

Theoretically, we ought to try to hold the present rate of production of oil about where it is, and not attempt to increase it, but let commerce adjust itself to the situation as best it may. But, practically, such a thing is impossible. We shall doubtless go on attempting the impossible—trying to keep production ahead of consumption. But the draining of the high producing fields will soon enough drive us to those of moderate and low production, and so force down the demand as the price keeps up.

One step in relieving the oil demand is to rush the development of power by falling water, in every place where this is possible. Another possibility in economy would be to

debar the murderous pest of reckless speeders from driving automobiles—to the killing of thousands of people every year.

We are now surely exhausting the underground reservoirs at a frightful rate. But the pessimists are wrong in their guess that petroleum will run out entirely within the space of a generation or two. It will take a thousand years to do that; and petroleum will be a factor in commerce for at least five hundred years more. Long before such final exhaustion, we shall be drilling into and taking the oil from the deepest of the known oil horizons; and there may be several more such horizons below the deepest of our discoveries so far—nobody knows, but the assumption is warranted.

While this recession is going on, we shall be profitably roasting out of the cliffs of shale that we know of, the oil that is there but does not seem to be. Then we will find other mountains of shale *ad infinitum*—and if not infinitum and if the oil should finally run out entirely, we shall have learned how to utilize the sun's rays for power, and so be able to get on rather nicely without the oil. But what if the theory of Kizhner should be true, that petroleum is being made now in the bowels of the earth, so as to renew to some degree our supply of oil for say two million years more! Let us be calm as well as sensible, and not borrow trouble!

Looking Ahead

Looking Ahead*

A profession is different from a trade. The ideal of a trade is to create habits in the apprentices, cerebral and muscular automatisms, for doing a thing always in the one and the same way; to create habits like the untaught instinct of the birds, who have an uncanny knack of nest building.

In a profession the automatism sought is quite as essential, but it contributes most toward the ultimate aims of the guild. That purpose is fixed and unalterable; in our profession it is nothing less than the bodily welfare of all clients and all people. We are to prolong the lives to the utmost, and reduce the pains of every sufferer who comes to us or to whom we are sent. More than that, we are to establish public hygiene, and try to compel the public to avoid sickness, and so escape our personal ministrations.

The means to the end vary in a hundred ways, and we acquire expertness in judgment and in certain manipulations, but the goal, the weal of the people we serve and the public, is forever the same. That is the "brow of the

*Commencement address at Rush Medical College of the University of Chicago, June 16, 1920.

hill" on which our vision is fixed, and we cannot change.

The carpenters form associations for personal amusement and cultivation of the mind, and for the safety of their incomes—if not their earnings.

The doctors likewise have associations, but if these fail of the purpose to make the members more efficient to lengthen life and shorten pain, they are in peril of the god of the ultimate ethics.

In the main our record is good. We have lessened suffering by a few apparent miracles—although starting some drug habits that have ruined a lot of people. We have lengthened the average span of human life, which is another proof of our usefulness.

We have found out and learned to destroy the causes of several diseases that formerly devastated whole nations; but we have ahead of us a hundred problems still seeking solution; and new ones now unthought of will arise; and the story will never be finished.

The last three-quarters of a century have given us a whirlwind progress in the sciences connected with medicine. And for the examination and study of the human body in disease we have a bewildering swarm of instruments, reactions, methods and means—physical, chemical, bacteriological and otherwise—all contributing to diagnosis and treatment.

This progress has made necessary numerous experts in using and applying the various means and measures; and we have the experts, and they are skilled indeed. It is doubtful that any normal man is capable of becoming highly expert in the use of all these various instruments and methods. If one were thus universally expert it would argue him as unnormal.

The practice of medicine in American cities is divided into some twenty-five specialties and the work of the general practitioner—otherwise the *generalist*. The generalists are probably five-fold more numerous than all the specialists combined. Most of them are doing their work better than it was ever done before. But a few of the specialists are cramped in vision by their devotion to a narrow field. With these it is another case of being unable fully to appreciate the forest, by reason of the trees. And too many of the generalists are hazy about both the trees and the forest.

* * *

And now we, in this particular alliance, are conniving at more intense specialization, for there will soon come the destruction of the old Rush building, and the creation on its ruins of a greater Rush—not a new "Rush Medical College," for the old one will then pass into history, but a new "Rush Postgraduate

Medical School of the University of Chicago." This change will mark an epoch and have a double purpose: (1) the drilling as experts in medicine of some of the more ambitious men through long and serious study; and (2) general research in all our sciences, and, please God, the solution of some of the riddles of human disease that have stared us in the face through all the years.

While the name "Rush Medical College" will disappear as a teaching body, its legal organization will not die, but will remain to preserve its charter (the oldest educational one alive in Illinois), and for the avails of some bequests of value that are known to exist. Nor does its going mean the ending of the work it has done with a constant upward trend for nearly a century. That work will be taken up without a break, and be carried forward under the ampler torch of a world university. And the name of Rush, so precious to us, will still hallow this spot, and be dignified by its connection with the next step forward of the University. And every alumnus will be the gainer.

Our specialists and generalists confront us with many problems. We are so much engrossed in the highly cultivated special fields that we too rarely visualize the well man or the sick man as a whole. It drives out of our minds—if indeed we ever had it—the picture that should be vivid and constant in our imagi-

nation, of the whole body as though transparent, with all its organs and machinery in action. As a rule nobody does that well but the highly cultivated and efficient generalist. And if he will have a critical spirit and listen to the voices in the air he has more chance to become the great philosopher physician than any other man. He can do certain forms of research of value which few others can or will do. He is enticed to study and consider the patient as a whole; and he can measure, and often needs to, the limitations of the specialists as no other man can; and he can jog the minds of these men when they forget, as they at times seem to, that no organ in the human body lives unto itself alone.

In the growth of specialties we have seemed in danger of shelving or degrading the generalist, whereas if he is alive to his occasion he is the most important man among us. He ought to be the wise judge and coordinator of the specialties; the first conserver of the interest of the patient, and not least in his use and profit from the services of the specialists.

In the history of medicine nothing has so magnified the importance and possible usefulness of the generalist as the perfection of the specialties. I say "possible usefulness" because we hear from some of the specialists that some of the generalists are so poorly informed that they don't know when their

patients need other help than their own. A few of the specialists say in their wrath that *all* the generalists are in this class. This is, of course, not true, but it reveals an unfortunate situation, and a real one; too many of the generalists are at fault; and it is due to two lamentable facts; one is the magnified importance of his particular work in the mind of the casual specialist. This is not surprising—he knows and daily works in *his* field, and in that alone, and it needs a broad mind not to overemphasize its importance. Also he has probably discovered that some generalist has neglected patients who were in sore need of the services of *his* particular specialty.

The other fact is that many generalists *are* densely ignorant of the worth of the specialists. It is reprehensible ignorance, for the generalist ought to keep himself informed of the work of every specialty. He should see often the work of his neighbors in special lines; and particularly he should see a lot of surgical operations—more than any other doctor save the surgeons themselves. And he should see every autopsy possible, for it is a helpful rule that the generalist should see the human body, both the dead and the living, under section more often than any other person. No generalist can reach the heights without following this rule.

Now, in order further to maintain this stand-

ard the generalist must develop and maintain a high and critical quality of scholarship. How can he do this? He must fight against two adverse forces; one is indolence and the wasting of time over trifles—otherwise, puttering. He must keep accurate records of his work and learn to hate slip-shod statements and records.

He must be with his patients a cross-examining lawyer, in order to sift their testimony and get at the exact facts, for failure as to the facts spoils a quarter of the diagnoses. Some experience in proof-reading would help; it tends to create a critical sense that is indispensable. Then he must search the literature to clear up doubts—and he must have doubts. And if he has doubts and seeks light, he will have the current and most authoritative literature. He must cut out the waste of time from much reading of daily newspapers. He will buy new books—not with leather bindings; he will take and read the one greatest journal (of the A. M. A., of course) and have some journals of research (there are several of them in English). Thus he will escape the intellectual drought of regarding the present day enigmas of science as necessarily among the unknowable. He will also probably escape that heretical belief—the mother of dry-rot—that a few favorite prescriptions *cure* most of his patients, when he knows, if he thinks, that more than ninety-five per cent. of all his patients recover spon-

taneously if they are allowed to rest, and that his chief service to the sick must be to assuage the suffering and dismay of all, and to fight off death for the few; and to do this he must fight his own temptation to procrastination—a procrastination that would put off antitoxin to the fourth day of diphtheria and delay appendectomy till perforation of the appendix.

Never before in the history of the world was it so necessary as now for scholars in general to try to coordinate and make useful to the mass, the flood of special knowledge of many orders, which experts have created in these later years. Only a few can know in detail the growth and significance of each of the many new or newly developed kinds of knowledge; but every scholar who essays to the widest usefulness may know what each class of knowledge can be made to do in the general scheme of betterment; and he ought to and he must collaborate with the masters of each specialty for the general good.

A recent reviewer[1] gives out this wail anent the confession of his own ignorance by that phenomenal egotist, Henry Adams, in his book on his own education: "Not that one does not sympathize fully with the admission of ignorance. The best and the wisest, the most earnest and the most thoughtful, admit it like-

[1]Gamaliel Bradford, in the Atlantic Monthly.

wise. The vast acceleration in knowledge of which Adams complained is the distinguishing feature of the twentieth century. We are swamped, buried, atrophied in the accumulation of our own learning. The specialist is the only relic of old wisdom that survives, and the specialist is but a pale and flickering torch to illuminate the general desolation of ignorance."

But there is no occasion for either alarm or despair. We only need more wisdom and economy in our own education, and in our use of the enormous mass of special knowledge, so as to make it into working tools for the world's progress, and not the means of choking our minds.

Once upon a time some pedagogues told us that, as each new kind of knowledge came along, it must be added to the existing curriculum and learned by all students who desired a correct education. The old requirement of Latin and Greek could not be lessened without grave danger of intellectual ruin. But it failed. The students grew broad in their heads and narrow in their bodies, and beyond a certain point their mental cramming was a measure of their increasing uselessness. We need to make the general scholar so broadly learned, so comprehensive in his knowledge of the human body, that he cannot master the details of the restricted specialist, and he must not pretend to. But he must know as none other

knows, how to help those restricted experts to the greatest usefulness for the general good.

Thousands of new laws are enacted every year in the various legislative bodies in this country by people who think they know what their constituencies need. But no lawyer can keep track of a tenth of these laws, except by the aid of his *Digest of the Statutes.*

Each live generalist must make his own Digest of the accomplishments of each of the specialties, and how they may help toward human health. And this Digest, whether mental or written, must undergo repeated changes as special knowledge grows and changes. It must be like a loose-leaved cyclopedia; a new leaf must often go into the book, and an old leaf with a lot of what yesterday was knowledge, but has ceased to be, must go out of it and to the scrap heap—and be forgotten, if possible. The failure to make such changes in the Digest marks the begining of a deplorable disorder that doctors have always been in danger of, namely, *intellectual fossilization.*

Besides keeping the Digest constantly up to date, there is for the doctor one other remedy against fossilization; that is to pray constantly for the discovery, the clearing up by somebody, sometime, somewhere, of the many unsolved problems in medicine. Even more important than to pray for it is to *expect it*, to look for

it, for that means a mental mood that pushes us forward to help in the search, and maybe the solution of some of the riddles.

There is for you graduates of today no finer prospect for a good career than in general medicine. Of course it requires peculiar ideals, temperment, and mental grasp—*and* that sort of selfishness that knows that the basis of ethics is the largest totality of happiness in the whole existence of the individual. If you like people—folks—and like to see them avoid pitfalls; if you can look on their foibles with indulgent humor; if you can forgive their sins, as you know your own fallibility, and be glad to help them up; if you can scotch that enemy of character, a youthful itching for big fees, and envy of those who get them before you do; if you can early learn how simple and few your real wants are, and that the satisfaction of doing each day the best that is in you is better than the trappings of luxury; and if you will swear that neither success nor riches shall lead you to vanity or ostentation, or to forget *your* days of small things; then you can become a great general physician and citizen, and you will have a shining trail of satisfaction ahead of you.

* * *

Our progress in the education of doctors and nurses during the last third of a century we know to be commendable. The public is

better treated and nursed than ever before. But great reforms are often attended with some misfortunes and abuses. So here we have fallen into some harmful, even cruel lines. We have separated the people into two classes, the rich and the poor; or those first who can afford to pay $25.00 a week for a hospital room, with $35.00 a week or more for nursing, and corresponding doctors' fees for elaborate diagnosis and treatment; and second, those who cannot afford to pay such charges.

The breach is wide between these two groups, and great harm is being done to a large company of excellent people, of self-respecting wage-earners and others of moderate means, whose wish is to pay all their just bills. They cannot afford the high charges, and they do not relish being deprived of hospital treatment except on the terms that they shall go to the public hospitals for paupers. It is true that occasionally one may find an endowed bed in a first-class hospital—but not over one in forty of those needed.

In many communities this situation amounts to a scandal that the medical profession ought to deal with. Nor should the profession alone deal with it, but all self-respecting lay people, especially those who have learned the privilege of giving money for the public good.

The problem involves three practical needs: First, cheaper hospital service. We must have

more hospitals that are cheaply and safely built, cheaply and comfortably furnished, and sufficiently endowed so that a small room can in ordinary times be furnished for $1.00 a day. There are several ways in which this can be brought about. A philanthropic organization could collect funds for such hospitals, and they could be built, if they were not strictly fireproof, for one-half what permanent hospital accommodations usually cost. And it is not indispensable that in a one or two-story hospital the structure should be strictly fireproof. Remember that nearly all the patients who would inhabit such a building come from homes which are highly combustible, and the hospitals would be fitted with fire-fighting facilities, and especially with means for rapid removal of patients.

Some existing standard hospitals are so situated that they could build a cheap pavilion on grounds adjacient to an existing structure, and detached from it, where the administration of the new part could be carried on with economy. Any existing hospital or any league or society that would start out with the unselfish purpose of creating such a hospital surely would find the public ready to help. A good name for such a novel institution would be "The Intermediate Hospital." A better name would be "The Mediate Hospital."

The next condition requisite is less expensive

nursing. These patients cannot afford over $2.00 a day in ordinary times. Registered nurses cannot work for that. This fact, and the need for less expensive nurses, reveals to us one of the hardships that have grown out of our commendable profession of nursing. We have insisted on such severe conditions for admission to our better training schools, and on so long a course of instruction, that we have created a nursing system that is too costly. It is necessary to have nurses who can work for half the wages that a registered nurse gets. The best remedy is a new one, which is to have young women with some grammar school education who can be drilled intensively for a few months on the simple, cardinal things that all nurses must do. Any bright girl can be taught in sixty days to take temperatures, pulse and respiration accurately, to prepare and administer invalid diet, to administer drugs in numerous ways, to give baths and fomentations, and attend to the personal wants of the invalid, and to keep accurate records of the patient, and of her own doings. For the average invalid these are the chief things required of a nurse. Of course, in critical cases a fully trained nurse would be necessary; also in most surgical cases, but not all; and where two or three nurses were required, one trained nurse and two assistants under her direction would usually be all sufficient.

What these young nurses should be called is a matter of taste. *Cadets* or *nurses' assistants* would do.

This plan does not disparage the dignity or calling of the registered nurse. Her standing would rather be enhanced if she had among her other attainments the ability to manage and teach cadet nurses under her.

There is now a demand in many quarters for more nurses. This plan would provide more nurses; and the good offices of the present registered nurses, and a little more patience on the part of the doctors, would make it certain that nursing as a whole would not be lowered in standard, but rather improved, when we consider that many patients would have nurses with *some* training who now are nursed solely by inefficient lay friends.

* * *

As to the training schools for nurses, it is a serious question whether their curriculum should not be changed. For example, the students are taught from books the anatomy and physiology of the human body. Most of that could be left out without harm. With that omitted and more time given to laboratory work, in examinations of the secretions, excretions and tissues of the body, chemically and microscopically; and if the nurses were taught more of the social and public health usefulness

in store for them, we would probably improve the output.

And it is a serious question, now being agitated, whether the three-year course for a woman who has already had some academic training is not six months or a year longer than is necessary. Dr. Philip King Brown, of San Francisco, a broad minded physician and a wise observer of this subject, says: "There is nothing in the training of nurses for the work that most of them do that warrants three years spent in getting that training."

Suggestions of this sort will probably be unwelcome to training school managers, but we need to face conditions as they are; and, with the evolving conditions in society and in science, it behooves us not to fancy that we have reached perfection in our methods. We should have minds open for any improvement that demonstrates its title. And one of the "things as they are" is the fact of a vast multitude of people between the two extremes of the rich and the very poor, who need and deserve some better things.

Third, we must have lower fees for diagnosis and treatment for the people of small means. Most doctors have in the past been ready to temper their fees to the purses of their patients. They will continue to do this, and it would be easy to arrange this matter for the patients in the mediate hospitals, if they shall materialize.

But the cost of expert examinations for diagnosis, while perfectly fair for the work done and for the skill, is often too much for the average wage earner in ordinary times. In all such cases, I am sure, the fees will be moderated to meet the situation.

* * *

You can easily divide your own profession into two classes. If you will observe sharply your doctor neighbors, how they converse with you on professional matters, and how they behave on the witness stand as experts, you will easily range them into two classes; those first who are able to tell their own blunders to their friends, and are able easily to say to their friends and as experts in court that they "don't know"; and, second, those who are unable to do either of these simple things. My advice to all young doctors is to try to belong to the former class, for they are big men; the latter is a group of smaller men.

I once heard a great and courageous surgeon tell how he as well as his patient on a certain occasion escaped some surgery. It was rather early in his surgical career. In the presence of some doctors he had opened an abdomen, hoping to account for some strange symptoms that had defied treatment. Only one abnormal thing was found. A piece of the descending colon, some four inches in length, was contracted to a narrow, hard cord. He showed

this to his audience and said: "This is a chronically inflamed and contracted piece of intestine. Of the cause we are ignorant, but we will cut it out and unite the two ends, and the man will recover." While he was preparing to make the section he and his friends were startled to see the cord slowly dilate and become normal like the rest of the gut. The case was one of *tetanic* spasm of a section of the colon—a common enough event, and one that is rarely even referred to in writings on abdominal disorders.

Many years ago a much prized friend of mine—since become famous as an internist and teacher—told this story of a profitable experience of his, soon after his graduation from an interneship. The hospital had given him a large experience in many things, but not in the erratic psycho-neuroses. He was called in great haste to a young lady who had suddenly become unconscious. Two doctors had been sent for; the other one was old and looked wise as well as venerable. The young doctor arrived first, and found the patient lying on her back, still, stiff, unconscious, and resting her weight largely on her heels and head. Her eyes were closed, she was not perceptibly breathing, and her pulse was a weak and flickering thing. While he was making a hasty examination, her friends, with tears and screams, begged him to do something for her.

He said with frank candor: "Why, she is dying—she is substantially dead; her breath has stopped and her pulse is nearly gone." They then again besought him to do something, and he replied: "I should be glad to, but I don't know what to do to raise the dead."

Just then the old doctor appeared, and my friend confided to him that death was imminent. The old man at first seemed nonplussed; then he asked the young man if he had tried *polarity*. He had not; he had never heard of it; and the old man proceeded to try it. He placed one hand on the girl's head and the other on her pubic bone and in a few minutes she took a deep inspiration, opened her eyes and was normal!

For illustration of the calamities likely to befall the expert witness, you should know the story of a lawyer of a former generation in Chicago who was dangerous as a cross-examiner. Once in court he led a medical witness (who was scrupulous about his reputation for universal medical knowledge) to confess that he was familiar with several medical books which the lawyer named as he held heavy volumes in his hands. Yes, the doctor had read them. The lawyer read extracts and asked the doctor if he was familiar with them. He was. Did he agree or disagree with the authors? The doctor answered promptly. After the witness had committed himself as to

several books and many questions of science, the lawyer turned to the court and jury and stated that there were no such authors and no such books; that the books he had pretended to read from were law books; that the titles he had given them were of his own invention, and the pretended extracts were his own, and that he had resorted to this device to discredit a bumptious and ignorant witness out of his own mouth. Of course the doctor was humiliated, by what he richly deserved; but that same trick has been since repeated in the Chicago courts at least three times, and once with an extremely reputable physician.

* * *

Time was when nearly every man who was graduated in medicine had before him a long and arduous trial in learning how to apply his knowledge to the needs of the sick, and how to deal adaptably with the well. Usually it was a painful experience for the young doctor, and sometimes even more painful for his patrons—in nerves, in spirit, in hopes and plans; in a human way it was a costly experience.

Later came the time when a few men had the fortune of a year or more of interneship in a general hospital. These lucky ones gained several years over their fellows in the professional race. Now, by the required clinical year, all men here start alike. Nobody expects they will remain alike and together, for that would deny

the variation among human beings. But it is a fair way for all, and it means a vast economy to the public as well as to the doctors.

Moreover, it will help to remove from the minds of some good people the suspicion that the young doctor is likely to be dangerous. That he is *liable* to be dangerous, we among ourselves freely admit, but that he is *likely* to be, we deny. We scorn that adverb. The thoughtful graduate from a hospital will be accepted by the patients in the mediate hospitals of the future with the certainty of good treatment, and the young doctor so serving, who needs most of all and as early as possible a large clientele and wide experience, can afford to serve these patients with small fees, or no fees at all.

But adding a year to the education of the doctor makes him entitled to an average of slightly higher fees, and the public can for better service afford to pay more, but the load must always be tempered to the weak shoulders. We do not serve the public for money alone; and it is one of the most important of the institutes of the profession that we shall give ourselves to at least two kinds of consecration. One is to the health interest of the public, and in this we have made good, for we have unselfishly, persistently and gloriously brought down the human death rate and prolonged life; and we have done this against the opposition of

some blinded devotees of strange cults who believe the microbes, the insects and the lower animals have greater rights in the universe than human babies. The other consecration calls for a like unselfishness, for it is a balancing of the scales of justice with all classes—the rich and poor alike—by each of us in his own little world of people. And the greatest pull upon our conscience must be for the major multitude of the people of disadvantage. Two blazing truths stand forth: One is that most of these are worthy people, among whom true saints are to be found; the other is that one of the greatest of all the virtues is mercy.

Hospitals and Nurses

Hospitals and Nurses*

In our recent great progress in the care of the sick, and especially in their hospital care, all of which has done a great amount of good, we have fallen into some unfortunate fashions. One is the fashion of sending all of the sick that we can to the hospital. As this fashion has increased, the home habit and capacity for health conservation have decreased—or failed to advance correspondingly.

Today the hospitals are overcrowded, and economists as well as doctors are wondering what we could do with the sick if a withering epidemic should come upon us. Notwithstanding the great patronage and high charges, the hospital managements protest that they are not making money, and that therefore there is small inducement to build new hospitals as a commercial venture.

But there is great need for more hospitals, especially for those so built and so endowed that the room charges to patients would be much reduced from the present figures, say to One Dollar per day. Hospitals should be built

*Read before a Branch of the American College of Surgeons, Los Angeles, Calif., February 17, 1922.

more cheaply. Inexpensive, detached buildings should be the ideal. I know fire-proof structures are desirable, but they are very costly. *And* substantially all of us live through our whole lives in combustible houses. Why, then, couldn't we consent to go to a Cottage Hospital that is half as combustible as our dwellings?

The hospital fashion should be modified. More patients should be cared for in their own homes, and many more minor surgical operations should be done there. One of the leading surgeons has just told us how he, in order to avoid the mental shock of operating room gestures, operates on certain cases in their beds in the hospital. It would mean more labor on the part of the household, more inconvenience for the doctors and nurses. And the household would need to be educated in the unusual care required—but that could be done—and it would be for the large benefit to the community.

There should be to some degree a revival of the old fashion of keeping the sick at home, and there should be in the household more real knowledge and less guesswork about sickness and nursing. One of the sorriest burdens of our lives—a great handicap to most of our households—is the enormous expense of sickness and premature death. And most of our homes are shockingly uninformed of how to conserve health and fight off sickness. And such information is so easily acquired.

Too often the city home rests on the knowledge that the hospital is nearby, and it has forgotten a lot of simple methods of caring for the sick, and so a sort of helplessness has grown up. There are human hands enough in half the homes to take care of their sick, if only they were not so ignorant, so easily demoralized, frightened and helpless.

One of the best kinds of missionary work today in many of our communities is to give to the lay public, the women especially, instruction on first aid to the sick and injured; and how to do the simple things of nursing the sick. They should all be taught how to take temperatures accurately, how to count the pulse and the respiration, how to examine the pharynx, and especially how to record their findings —and to record them. They should be instructed how to make accurate records of everything pertaining to the patient—his food, sleep, sensations, suffering and otherwise; his excretions, and all changes from a normal condition. Whenever did it happen that a physician, called to a patient sick in his home for three or four days, has found a scrap of written history of the case? Not once in five hundred cases. And every practitioner knows the vital importance of the history of the beginning of the sickness, for diagnosis and prognosis.

The missionary would find the women of our households greedy for such instruction; and

every housewife and daughter would become, by a few lessons, an extremely useful observer and nurse for simple conditions. By more knowledge they would be more sure of themselves, less in danger of stampeding by sudden sickness or injury—and so their courage and self-respect would grow—to their comfort and satisfaction—and to the unspeakable benefit of their sick ones. From being proud of their own ignorance, as many of them are today, a multitude of these people would be proud to know that they could do these simple and useful things, and that they could make written records that any physician or trained nurse would commend.

The missionary would help to remove from the public mind many false ideas about the sick and their treatment—and the oft-found notion that education in medicine is needless, and that an uncultivated layman may know the mysteries of human disease by intuition. This foolishness is both pathetic and grotesque.

A great surgeon, an early Fellow of the College of Surgeons, had once prescribed for his mother-in-law. The next day she came to him and said, "John, I have just seen Mrs. Blank, and she says you are wrong in that prescription of yours." He replied: "She may be right, but I think that before you act on her suggestion, you ought to go out and ask the policeman on our street what he thinks about it."

One of the most crying needs, both in the hospital and in the home is for less expensive nursing. People of moderate means cannot pay $25.00 a week for a room in the hospital and thirty-five to forty dollars a week for a trained nurse. There are millions of these people—the best in all the world—and they must be cared for in their homes, if they have homes, or go to the County Hospital; and those who have no homes must go to the County Hospital anyway—which is a pitiable hardship.

There must be—and there is surely going to be—a new order in nursing and nurses. We have about reached the point where nearly every educated nurse has been educated too expensively—so expensively that her charges are too high for people of moderate means. The remedy is to educate a lot of nurses less expensively, who can work for half the fees of the highly trained ones. They should be girls and young women, with a requirement of not more than a grammar school education, who will be trained intensively for not more than two or three months to fit them to be the assistant nurses or cadets under the supervision, in critical cases, of highly trained nurses, and in simple cases under the sole direction of the physician.

For the simple things of nursing of the average case, there is no need for a college grad-

uate, or even a high school graduate, who has been instructed two or three years in facts of physiology and anatomy as well as the more practical phases of nursing. To paraphrase an utterance made elsewhere: Any bright girl can be intensively taught in sixty days to take temperature, pulse and respiration accurately, to prepare and administer invalid diet, to administer drugs in all ways (except intravenously), to give baths and fomentations, and attend to the personal wants of the invalid, and to keep accurate records of the patient, and of her own doings. For the average invalid these are the chief things required of a nurse. Of course, in critical cases a fully trained nurse would be desirable; also in many surgical cases (probably not half of them); and where two or three nurses are required, one trained nurse and two assistants under her direction will be all sufficient.

At present our highly trained nurses, after probably a High School education, possibly some college study, and three years of training in and out of hospital, are doing much—even mostly—routine work that the cadet nurse could do well enough. The highly trained nurse should be reserved for people abundantly able to pay her (for any sort of a case), and for critical cases and critical situations requiring such skill as she alone has. The advent of cadet nurses would dignify and make more

useful the highly trained nurse. And the latter ought to favor and further this movement—for it means a distinct promotion for her. By creating a lower order of nurses, the dignity of her order is emphasized and advanced. But lamentably the regular training schools, as well as most of their graduates, are opposed to the progressive movement here advocated.

The high class training schools for nurses might profitably revise their course of study, and it should be shortened to two years or less. Most of the anatomy and physiology should be cut out of it, and there greatly needs to be added some instruction in the psychology of the sick as compared to that of the well. The pupils had better read William James rather than pore over the medical books that doctors have to struggle to master—if indeed they ever do master them. The psychology of the sick and the well means an understanding of how to manage the patient's mind, his whims, idiosyncrasies, his prejudices, and maybe his delusions. And a nurse who has learned that has unavoidably learned how to manage her own psychology, often to hold her anger and her tongue; to forget some of her crotchets, and to soothe without annoying. And a nurse who can do all this is equipped indeed—she is a rare exception to the rule.

The high class training schools now are crying for more pupils for training. It is no

wonder that these are scarce. Of course highly educated young women balk at the idea of spending three or more years in learning so simple an art as nursing the sick.

Why have these splendid training schools so expanded their curriculum? I don't know, unless it is the ambition of their scholarly superintendents to create a nursing profession of scholars. They have accomplished that purpose to some degree—but to the loss of some greater service to the public which they might render. We have too long tried to attain the impossible, and I for one move that the scholar nurses—magnificent women that they are—be reserved for situations that need them (and can adequately pay them), and that cadet nurses shall do for the multitude the tasks that require not scholarship, but honesty, faithfulness, the knowledge really required for their work, and that divine fragrance called common sense.

Cadet Nurses and Home Nursing

Cadet Nurses and Home Nursing

Suggestions for Organization of the Work

A good field for the development of home nursing, of cadet nurses for the weal of the needy general public; and for general education in such matters, including ideal practical housekeeping, is offered to average communities of say 10,000 people, anywhere in this country. The requisites might be listed tentatively as follows:

1. The union of four or five stable medical men, committed to this idea, and able to work together harmoniously and unselfishly for success. Then the enlistment of a few lay men and women of progressive ideas and vision for public benefit, to help in practical ways.

2. Procure some old, roomy house with a large lot. Scrub and fumigate; fix and fit the house for an aseptic hospital for say 6 or 8 patients, one room for operating; or a small detached building could be made with operating room, and rooms for 2 or 3 surgical patients under the same roof. Detached cottages for

other patients could be built on the same lot as needed. Each cottage for 4 or 5 patients. The expense of these additions would not be great; wood structure probably. Wide spaces between the buildings.

3. Secure one or two highly educated and refined trained nurses, with capacity for teaching, to take charge of the hospital and to teach the pupil nurses, both by lectures and drill. These must be women who are consecrated to this new kind of missionary effort.

4. The pupils would be from the homes of the town—women from 16 to 40, who would live at their homes, and give a few hours a day to the lectures and the practical work in the hospital under the head trained nurses.

5. The course of study and training in home nursing would be similar to that designed by Dr. Robertson of the Health Department of Chicago, and would be something as follows:

(a) A course of lectures and demonstrations of 6 or 8 weeks, an average of two hours daily. The class might, if too large, be divided into two sections, each section coming on alternate days. Each lecture and demonstration would consume at least two hours, one hour for each. And the pupils would, as far as practicable, enter into the demonstrations.

(b) The lectures would first emphasize the ethics of all nursing, the first great principle of which is: That all nursing is confidential, and

that to betray the confidences, weaknesses or whims of the patient is forever an unforgivable sin. Then would come a little bacteriology, asepsis, first aid, sanitation, ventilation, contagious disease nursing, diet, obstetric nursing and the care of the baby; and the giving of medicine with scrupulous accuracy, especially hypodermics.

(c) The demonstrations would include bed-making, bandaging, bathing, fomentations, plain urinalysis, temperature, pulse, respiration, water treatments of all sorts, and all the manifold phases of surgical cleanliness—insisted upon constantly.

(d) After some weeks of work as outlined above, the lectures and demonstrations in a longer course would deal with the higher technic of the operating room, both surgical and obstetric.

(e) In order to make ideal home nurses and housekeepers, the pupils would do nearly all the work in the hospital. Each pupil would have a short turn at every sort of work. They would eventually do all the cooking and serving in the house. The work would cover the entire range from scrubbing floors and cleaning house, to the most artful cooking and assisting at the most delicate surgery.

6. The pupils would pay say $5.00 for a short course of 6 or 8 weeks, and $10 to $25 for a course of 16 weeks—really in advanced instruction.

The instruction would be given by the highly trained nurses and the doctors; it must never be slip-shod but always painstaking and thorough. In a year some of the advanced pupil nurses could be utilized for some of the teaching.

Pupil nurses (or Cadets) would be given certificates for courses taken, and after receiving such would be ready for outside calls for service in selected cases.

It would be desirable that women applying for this work should have already a grammar school education. This would probably eventually be insisted upon.

This plan I believe to be workable in most towns of ten to twenty thousand people, of a mixed community. It might need to be modified in various ways to suit circumstances.

The great purpose that should never be lost sight of is (1) to furnish hospital care to many people of small means—as well as good nursing, at moderate expense; and (2) to educate most of the women of many households to be good and effective nurses for their own people with the commoner sicknesses and accidents of life, and to be grounded in the principles of cleanliness, asepsis and good hygiene.

The hospital would be a practice school, like any other practice school in an educational system. Here it would give practice in good housekeeping and nursing. The hospital would

be largely a free one for selected needy persons; patients able to pay moderate rates would do so. These rates and the fees from the pupils would go far, and might be sufficient, to sustain the institution. A generous public would take care of any small deficit in a work so manifestly helpful and needful.

This plan means, of course, intensive training in a new education at a teachable time of life for women who are avid to be equipped in a new art. With the demonstrations and actual practice that go along with the teaching, the plan is sure to be successful. Hundreds of instances during the Great War; the experiences of all manual training schools and of working laboratories all over the country, have shown that this sort of intensive training is always successful because it is always enjoyed. It is the only plan by which new habits in any art can be acquired quickly—and the wonder is that educators in many lines have been so slow to adopt it. During the war in thousands of instances we drilled raw recruits to be good gunners, successful assistant engineers in ships, even in battleships, and successful nurses—all in the space of two or three months. We can do similar things in civil life, for it is founded on human psychology—human nature. The cells of the brain and other nerve centers acquire new habits—otherwise new automatisms—at a rate geometrically proportionate to

the rapidity of the repetitions of a new movement. And the old, contrary habits are driven out or repressed at the same rate.

To E. P. R. on Attaining His
Seventieth Year

To E. P. R. on Attaining His Seventieth Year

From your grand Sabbatical milestone it seems a long way back to your early discovery that your toes were good things to play with and to put into your mouth.

Various epoch stakes have marked the journey—your boy griefs and pleasures, your first job, your first love affair and your first baby—your professional promotions and sense of power. The years have rushed because you liked your work and succeeded, and knew the sun was always shining somewhere. Your power to consider the essentials and neglect the trifles, have kept your goal always in sight.

You early learned that truth does somehow consist with the universe, and that has swept away many difficulties.

You have read the sages and become one of them yourself. You have seen the pictures and flowers by the way, and heard the music of childhood and song, and of the voices of a host of friends that you have made because you are

full of the nectar of friendship yourself; and you have lightened the tedium of toil by some gentle satire and roguish wit.

Rugged friend of friends, friend of all the people, maker of history and prosperity—with the modesty of greatness and proof against flattery; may you go on in work and play, at least to your next decennial milestone, with all the joys of earth and the blessings of God.

UNIVERSITY OF CALIFORNIA LIBRARY
Los Angeles
This book is DUE on the last date stamped below.

orm L9–42*m*–8,'49(B5573)444

THE LIBRARY
UNIVERSITY OF CALIFORNIA
LOS ANGELES

UC SOUTHERN REGIONAL LIBRARY FACILITY
A 001 354 533 0

R117
B76m